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GLEANNINGS

IN BEE CULTURE

CONTENTS

MARKET QUOTATIONS	1035
STRAWS, by Dr. Miller1039
PICKINGS, by Stenog	.....1041
CONVERSATIONS WITH DOOLITTLE	1042
EDITORIALS	.....1043
Wonderful Ways of Honey-Bees	.....1043
The National Association	.....1043
Bee Paralysis, Easily Curable	.....1043
Moving Bee Short Distance in Winter	.....1043
Frames Supported on Nails	.....1043
Covers for Hives	.....1044
Candied Honey	.....1044
How to Keep Honey Indefinitely	.....1044
Giving the Page Number	.....1044
Comb honey Canards	.....1045
Aikin's Candied Honey in Paper Packages	.....1045
Honey Plants of Arizona	.....1046
Stingless Bees	.....1047
GENERAL CORRESPONDENCE	.....1047
Wintering Indoors in a Mild Climate	.....1047
Modern Queen Rearing	.....1048
Queenless Bees	.....1049
A Colony with a Caged Queen	.....1049
The Upper Story of a Strong Colony	.....1049
A Divided Brood-chamber	.....1049
Preparing Cells to Graft	.....1050
Modern Bee-keeping in Arizona	.....1051
Making Alfalfa Hay on a Large Scale	.....1051
Twenty Tons of Alfalfa Honey Piled Up	.....1051
Drone Comb in Shaken Swarms	.....1054
Reports Encouraging	.....1058
Silk Industry of Michigan	.....1058
Hairy vs. Sand Vetch1057
OUR HOMES1056
GARDENING1058
SPECIAL NOTICES1057

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The A. I. Root Co.,
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GRADING-RULES.

FANCY.—All sections to be well filled, combs straight, firmly attached to all four sides, the combs unsealed by travel stain or otherwise; all the cells sealed except an occasional cell, the outside surface of the wood well scraped of propolis.

A No. 1.—All sections well filled except the row of cells next to the wood; combs straight; one-eighth part of comb surface soiled, or the entire surface slightly soiled, the outside of the wood well scraped of propolis.

No. 1.—All sections well filled except the row of cells next to the wood; combs comparatively even; one-eighth part of comb surface soiled, or the entire surface slightly soiled.

No. 2.—Three-fourths of the total surface must be filled and sealed.

No. 3.—Must weigh at least half as much as a full-weight section.

In addition to this the honey is to be classified according to color, using the terms white, amber, and dark, that is, there will be "Fancy White," "No. 1 Dark," etc.

MILWAUKEE.—Since our last report the receipts of honey have been liberal—rather accumulative—especially on comb, the demand has not been equal, and values are lower to sell. The increased supply is one factor to weaken values, and another is that some who have honey to sell make a lower market by offering to sell below quotations, which otherwise might be more easily maintained; and some deliver at a price made by buyers, which has a temporary depressing effect on market values. We look for a consuming demand for the supply, and will quote as follows: Comb, fancy section, 13@15; No. 1 sections, 12½@13; extracted, in barrels, old or damaged, nominal, 10@11; cans, kegs, pails, choice, well ripened, white, 7@8; cans, pails, choice, well ripened, dark or amber, 6@7. Beeswax, 28@30.

A. V. BISHOP & Co.,
119 Buffalo St., Milwaukee, Wis.

PHILADELPHIA.—Honey seems to be arriving quite freely, and, as is usually the case at this time of the year, parties who have been holding back the honey are rushing it to market and breaking prices by offering it at much less than its actual value. If bee-keepers would only give the large cities nearest which they resell an idea of what honey they have on hand, it would be an amicable arrangement both to the seller and producer. We quote fancy white, 16c; No. 1, 15c; amber, 13@14; extracted honey, white, 7@8; light amber, 6@7. Beeswax still in good demand at 31@32, according to quality. We are producers of honey and do not handle on commission.

WM. A. SELSER,
10 Vine St., Philadelphia, Pa.

TOLEDO.—The market for comb and extracted honey has been rather quiet for the past two weeks, as have all other lines of staple goods, but prices remain practically unchanged. Fancy white clover brings, in a retail way, 16c; No. 1, choice brings, in a retail way, 15c; buckwheat brings, in a retail way, 14c; extracted white-clover in barrels, 7c; in cans, 8c. Beeswax, 28@30.

GRIGGS BROS.
Toledo, O.

CINCINNATI.—The market on comb honey has weakened, as the supply has been larger than the demand. Quote fancy water-white at 14; off grades, lower. Extracted I quote as following: Amber in barrels, 5½@5¾; in 60-lb. cans bring ½c more; alfalfa water-white, 6@6½; fancy white clover, 7@8. Beeswax in good demand; will pay 30c for nice wax delivered Cincinnati.

C. H. W. WEBER,
2146 Central Ave., Cincinnati, Ohio.

ALBANY.—In our last quotation there was a misprint; the word "heavy" should have been honey. We meant to say then as now honey market much easier, the cold weather checking demand and checking the honey. We quote white-clover, fancy, 15; A No. 1, 14; No. 1 13½; mixed, 12½@13. Extracted, no change, 5½ to 7 whole range.

MACDOUGAL & Co.,
375 Broadway, Albany, N. Y.

DETROIT.—Fancy comb honey, 16; No. 1, 14@15; darker grades, 12@13; extracted white-clover, 7@7½. Beeswax, 28@30.

M. H. HUNT & SON,
Bell Branch, Mich.

BOSTON.—Owing to very large receipts of California honey we quote our market at the present time as follows: Fancy white, in 1-lb. sections, 16@17; A No. 1, 16; No. 1, 15. No call for No. 2. Extracted, 6@8 according to quality.

BLAKE, SCOTT & LEE,
Boston, Mass.

COLUMBUS.—We are pleased to report a very satisfactory market on honey, but with a lighter demand owing to the near approach of Christmas. Prices range from 13@15 on white; 11@13 on amber; and 10 on buckwheat. We are in shape to handle both large and small shipments.

EVANS & TURNER,
Columbus, Ohio.

CHICAGO.—At this season of the year there is not much trade in honey, retailers having laid in their stock for the holidays. Fancy comb honey for the Xmas trade has brought 13½; No. 1 grades 12½@13; amber, 9@10; extracted white, brings 6@7; amber, 5@6. All extracted honey is sold on its flavor, quality, kind, and style of package. Bee-wax, 28@30.

R. A. BURNETT & Co.,
199 South Water St., Chicago, Ill.

SAN FRANCISCO.—Honey, new comb, white, 12@14; amber, 10@12; extracted, water-white, 5½@6; light amber, 5@5½; dark amber, 4½@5. Beeswax, 80. Wholesale wax prices are higher than for months past.

ERNEST B. SCHAEFFLE,
Murphys, Cal.

TORONTO.—Prices on honey remain about the same here. Best extracted from 7@8 per pound, with just a little better demand; comb honey advanced a little, price at present from \$1.60 to \$1.75 per dozen for A No. 1 and fancy; \$1.50 per dozen for No. 1 and good No. 2.

Dec. 8. F. GRAINGER & Co., Toronto, Can.

SCHENECTADY.—As is usually the case at this season of the year, trade is generally in the direction of holiday goods, and honey market rules quiet and prices not as firm with ample stock on hand. We quote fancy white, 15; No. 1, 14; amber, 12@13 buckwheat, 12@13; extracted, light, 6½@7½; dark, 6@7.

CHAS. McCULLOUGH,
Schenectady, N. Y.

KANSAS CITY.—Receipts of comb honey larger, demand fair, prices easier. We quote fancy, 14 section case, \$2.50@2.75; No. 1, 24-section case, \$2.75; No. 2, 24-section case, \$2.65; extracted, white, 7@7½; amber, 6@6½. Beeswax, 25@30.

C. C. CLUMMONS & Co.,
Kansas City, Mo.

BUFFALO.—There is not a very active demand for honey and still white comb and striped clover sell pretty well. Fancy white comb, 14@15; A No. 1 white comb, 13½@14; No. 1 white comb, 12½@13; No. 2 white comb, 11½@12; No. 3 white comb, 11@11½; No. 1 buckwheat comb, 11@12; No. 2 buckwheat comb, 10@11; white extracted, 6@7; dark, 5½@6. Beeswax, 28@30. Small crates of honey sell the best.

W. C. TOWNSEND,
Nov. 28. 178 & 180 Perry St., Buffalo, N. Y.

FOR SALE.—Three tons comb honey, in 4x5 sections, put up in glass-front cases.

J. I. CHENOWETH, Albion, Iowa.

FOR SALE.—Thirty barrels choice extracted white-clover honey. Can put it up in any style of package desired. Write for prices, mentioning style of package, and quantity wanted. Sample mailed on receipt of three cents in P. O. stamps.

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301 Huntington Ave., Buffalo, N. Y.

FOR SALE.—Clover or buckwheat extracted honey, in 165-lb. kegs. Write for prices. Sample, 8c.

C. B. HOWARD, Romulus, N. Y.

FOR SALE.—1000 lbs. No. 1 white comb, at 14c, and 2000 lbs. No. 1 extracted, at 7½c.

W. D. SOPER,
Route 3, Jackson, Mich.

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A JOURNAL DEVOTED TO BEES, AND HONEY, AND HOME INTERESTS. ILLUSTRATED SEMI-MONTHLY Published by THE A. R. ROOT CO. \$1.00 PER YEAR MEDINA, OHIO.

Vol. XXXI.

DEC. 15, 1903.

No. 24



ALL RIGHT, Mr. Editor; zinc is the thing for numbering-tags.

So HUBER has been going breakfastless for years. He's a husky-looking chap to be starved after that fashion. [I have also a niece who is a no-breakfast fiend, and she is the picture of health.—ED.]

THE RETIREMENT of Editor Bertrand, of *Revue Internationale*, will be to me as to many others a real personal loss. [See what Frank Benton says in Pickings in this issue in regard to Editor Bertrand.—ED.]

"A WISE MAN seldom changes his mind: a fool, never." I don't want to be in the fool class, so I'm going to change my mind. I'm not going to vote for E. R. Root for director, but for that jolly Canuck, William McEvoy. He's a good one.

THANKS, Mr. Editor, for the full information about that automatic smoker, page 1000. It's worth a good bit, sometimes, to know that we don't want a thing. An old-fashioned automatic smoker is a pan containing a smudge-fire on the windward side of the hive. But give me a good bellows smoker.

H. J. SCHROCK, I think that "old bee-keeper" did not observe closely enough if he thought the circle of bees kept the queen from laying, page 1012. This is probably what you will find: Whenever a queen remains still long enough, a circle is formed, facing the queen. The queen does not remain still because the circle is about her; but the circle remains because the queen is still. The instant the queen makes the slightest signal to pass on, the circle opens up for her free passage.

S. J. RICHARD reports in *Revue Internationale* that for three consecutive years a colony with its entrance at the top of the hive did not swarm, while a colony beside it with entrance below swarmed. He then changed the lower entrance to the top, and since then, six years, neither colony has swarmed. [It does not seem possible that the mere location of the entrance could have any effect upon this question of swarming. This experiment is interesting; but it would be more interesting if it worked in the same way in the case of 100 colonies.—ED.]

I'VE READ, several times over, that item of inspector Hinckley, page 1014. If he can cure foul brood by merely spraying formaldehyde on the hive-floor three times at intervals of two weeks, it's a big, a very big, thing. It's hard to believe that the microbes can be killed without killing the bees; yet it may be possible. I suppose it is not necessary to kill the spores, on the supposition that four weeks after the first treatment they have all germinated. [If the plan described by inspector Hinckley shall work equally well with others it certainly will be "a very big thing." I hope we can get reports from others next spring or summer.—ED.]

I SPENT some time polishing up that wheelbarrow Straw, p. 996, and patted myself on the back for having got off a good joke. Along comes the editor and spoils it all by saying I've made another slip. And now I'm distressed to know whether the joke is on me or him. Perhaps I deserve punishment for not labeling my jokes. [Your joke would have been transparent, doctor, if you had not put in that clause, "wheeling one another." I told Stenog that I was sure it was one of your unlabeled jokes; but we finally agreed that the disclaimer threw that out of possibility. Next time, polish your jokes a little more and they will pass muster.—ED.]

SLOW LIQUEFYING will keep honey in a liquid condition longer than if it be liquefied in a few hours. If you don't want to spoil the flavor, heat it in water no hotter than you can hold your hand in. Yes, I

know I'm guilty of plagiarism in writing that, because it was said on p. 1002. But it's important enough to be said over again. When I read, "not much hotter than you can bear your hand in," I said, "That's pretty cool, Bro. Aikin." I put a thermometer into a dish of water, put my hand in the water, and poured in hot water till it was too hot for comfort. I found I could hold my hand still in the water at 122°. The washwoman happened to be here, and she could stand 145° for any length of time. I could stand 145° for about two seconds. So instead of saying "not much hotter" I now prefer to say "no hotter." Another point: If the heating is done before any granulating occurs, I *think* the results will be better than if the honey be first allowed to granulate. [I think there is something in this.—Ed.]

SUPERSEDURE CELLS are sometimes started over larvæ in worker-cells, page 1012. That's new. Have you seen that, Mr. Editor, *with a laying queen still in the hive?* [I based my statement on the observations of our Mr. Phillips, who has been running some 550 colonies for queen-rearing for us this season, and he has also had a large experience with his own bees in Jamaica. He distinctly remembers that supersedure cells have been started over larvæ in worker cells, while the laying queen is in the hive, although he admits that such a combination is not common. He says: Dr. M. will notice by referring again to the footnote that a *rule* is set forth, and it is that bees working under the supersedure impulse proceed with the building of cells as in swarming. Like most of the other rules that apply to bee-keeping, however, it admits of variation. Defective queens which the bees are trying to supersede may be of *all kinds*—some fairly prolific, others barren; some defective through old age, others as a result of an accident. If it were certain that queens being superseded would continue laying until the day of their death, and the bees were left undisturbed to proceed by nature's plan, then the raising of queens from "*pre-constructed*" cells might be said to be invariable. But this is not the case: Queens sometimes stop laying altogether before they die, and if, as intimated in the footnote in question, the supersedure cells are removed as fast as they are built, and the fecundity of the queen ceases, the only resource left to the bees is to make "*post-constructed*" cells the same as a queenless colony. The only question is, would such a queen be called a "*laying*" queen? That the editorial comment is correct I am certain.—Ed.]

YEARS AGO we bought lumber and made our own hives. Gradually the thing has changed until nearly every one has decided that he can buy hives, etc., cheaper than he can make them. Now that there has been an advance in prices, bee-keepers are advised to go back to the old way, p. 1003. Let's see: Suppose that, five years ago, it

cost me 10 per cent more (as I think it did) to make my own supplies than to buy them ready-made. Suppose that there is now an advance of 40 per cent in the cost of labor and material, and that there is an advance of 40 per cent in the price of the ready-made stuff: Is there any change whatever in the relative situation? And will it not cost me now 10 per cent more to make than to buy, just as it did five years ago? I don't see the logic of saying that, because every thing has advanced, now is the time for us to do our own manufacturing. If the per cent advance in price of supplies is sufficiently greater than the per cent advance in price of labor and material (say 45 per cent or more), then it may be worth while for me to think of making my own supplies; otherwise, not. [I have referred the answer to this Straw to Mr. Calvert, who fixes the prices on goods that we sell. He says: Your reasoning is all right. The trouble with the one who ventured the advice that bee-keepers better have their hives made at the local planing-mill, is, I fear, that he was counting on buying his lumber at the same old price. If so, he has reckoned without his host. I have just made a comparison of bills for lumber, both for hives and sections, paid five years ago, with those paid during the past six months, and I find that 40 per cent must be deducted from present prices of lumber, and in some cases 45 to 50 per cent, to bring them down to the level of prices paid then. The difference in labor is not quite as much. I find, also, that, by deducting 40 per cent from present prices on hives, sections, frames, and shipping-cases, the remainder corresponds very closely to the list prices of five years ago. The advance in prices of supplies has simply kept pace with the advance in cost of material. We have bought within the past year over five and a half million feet of lumber, and ought to be in position to know what such material costs as compared with former years.—J. T. C.]

ON PAGE 528, Mr. Editor, you said, "Now, is it hard to suppose that a three-story hive, run for extracting, might average 70,000 bees?" I replied, p. 579, "Nothing very hard about it for me; but how about a certain editor who not so very long ago was trying to convince me that such a thing was an impossibility?" You then said, "I can not recall to what you refer. I have advocated strong colonies . . . and last year I had several three stories high, and one or two four stories. If some of them did not have 100,000 bees it would be strange." I thought I would refresh your memory by giving you the page to which I referred, and began leafing back, saying all the while, "Oh! but won't I roast you, my fine fellow, when I fling in your teeth just what you said?" I leafed back to March 1, through four months, but didn't find it. Leafed it over again. Didn't find it. Instead of roasting you, I began to feel chilly myself. It was July, and I was very busy; but I patiently hunted over the

ground again with no better success. The thing was so fresh in my mind that I concluded it wasn't worth while to go any further back, and I began to wonder whether I had not dreamed it, mentally resolving, however, to renew the search if I should ever have the leisure. This being Thanksgiving week, I began to breathe more leisurely, and to-day I thought I'd decide whether I'd been dreaming or not. I turned over the pages of GLEANINGS, back, back, back, and—would you believe it?—I never struck it till I got into 1901, and found the thing started April 15 of that year. On p. 431, 1901, you challenged me to find a colony of more than 45,000 bees, and tried to wheedle me into being a dude by offering me the best plug hat I could find in Marengo if I succeeded. Now, inasmuch as I can show from p. 579 that it would be strange if some very strong colonies would not reach 100,000, I ought not to have much trouble to find a colony of more than 45,000 to secure that hat, ought I?

P. S.—How much will you allow me for that stovepipe if I discount 5 per cent for cash? [You have fairly earned your plug hat. When you go to Chicago next, go to the best hatstore in the city and get fitted for a plug hat and send your bill in to me. But if I foot the bill you must wear the hat at the conventions and everywhere else where common folks go. As you are short and stout, a stovepipe would top you out in good shape. But referring to the question at issue, I based my first statement in 1901 on the fact that 9 lbs. was the largest swarm of bees that I had ever weighed, and it filled two and possibly three stories. We used to buy bees by the pound of the farmers during the swarming season, and the 9-lb. weight was the largest we ever paid for. Of course, a three-story colony in Jamaica could have a good many more than this. I will admit, however, there is a conflict of statements. I still think that a 9-lb. swarm is the biggest that we shall ever have in northern United States; and yet I believe that a four-story colony might contain 100,000 bees. Say—I am going to camp on your trail. If I can catch you good and square, will you buy me an automobile?—Ed.]



A foreign journal says if honey is heated above 174 degrees, the point at which alcohol boils, the volatile oil which gives the honey its flavor will be expelled, giving in the residue a flat and insipid taste.

Another journal says it is better to sell

honey of a slightly inferior quality to one to whom we can explain the matter fully than to market it and thus injure our own reputation, and cause honey itself to fall into disfavor.

A Dutch journal, I believe it is, says the best system of wintering is that which gives us the greatest number of healthy bees in time for the first flow of nectar; and experience alone can decide the matter for each.



REVUE INTERNATIONALE.

In the previous issue I announced the discontinuance of this journal on account of Mr. Bertrand's health. Just as we were going to press, the following came from Mr. Frank Benton, in addition to what I had already translated. I most cordially indorse what he says in the following, for he is, probab y, the best-qualified man in the world to speak on this matter:

This journal has presented, during these 25 years, a vast amount of excellent information on apian topics, and has had great influence in introducing American methods into the various countries of Europe, particularly into Switzerland, France, and Russia, and it will be greatly missed in the future. For my own part I hope that decision of Mr. Bertrand to retire may bring forward some successor who will continue the publication. I am sure that those to whom Mr. Bertrand's journal has been a welcome visitor from month to month will wish him many peaceful years yet after his earnest efforts in the advancement of apiculture.

Washington, D. C.

FRANK BENTON.



EL COLMENERO ESPAÑOL.

In speaking of bee-keeping in various countries, the editor says this of Chili, after speaking of the United States as mentioned in our previous issue:

Although Chili can not be compared with the United States, still it has an extraordinary number of colonies of bees in antique skeps, and some in modern movable hives. This is the only nation of America which offers competition to the honeys of Europe.

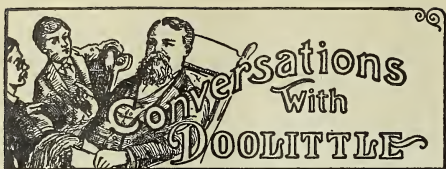
In the A B C book will be found a fine view of a Chilian apiary.

In speaking of Cuba the editor says:

Cuba also has many colonies kept in the old-style way, almost in a wild condition, as they are found in the forests, and belong to nobody. Those who exploit this public wealth are the negroes, who send the honey and wax to Europe, and thus put up competition to European products. There are many important apiaries in Cuba using the movable frame.

In Santo Domingo, Argentina, Uruguay, and Mexico the modern hive is known, but too few in number to attract attention. "In the rest of America," the editor says, "the movable system is almost entirely unknown." Coming to Germany we find, of course, a different state of affairs. We read:

This country contains 2,000,000 hives of the movable-frame type, so that Germany's apicultural condition is the most important in Europe. In spite of its cold and forbidding climate it produces annually 18,000 tons of honey, the quality of which is very fine and white. As it is produced from cultivated plants it has no pronounced flavor. Germany is the country that has the largest number of apicultural societies; and, likewise, has the largest number of bee-journals, as every society has its own mouthpiece. These societies have the support of corporations and of the government, and they have continual conventions for the development and spread of apicultural knowledge.



TO COMMENCE IN BEE-KEEPING.

"Is this Mr. Doolittle, the bee-keeper?"
 "My name is Doolittle, and I keep a few colonies of bees. What is your name?"

"My name is Beebe, and I wish to commence keeping bees in the spring. A neighbor told me to come over and see you, and you would tell me something that might help me in starting. I had thought of buying fifty colonies. Do you think that number would be as many as I should buy?"

"I should say that said number would be from five to ten times as many as any beginner should buy, unless he has considerable knowledge of the business before thus starting into it."

"Why do you say thus?"

"Because the beginner should guard against going recklessly into bee-keeping by putting his last dollar into a business of which he knows nothing. It is this getting crazy over a business which looks to be a good thing, but with which we are not acquainted, and investing all we have in it, expecting to make a fortune, which ruins so many. To be successful in any thing, a man must 'grow up' in it by years of toil and study till he becomes master of the business, when, in nineteen cases out of twenty, he will succeed."

"Is that the way you commenced?"

"If you will pardon a little personal reminiscence I will tell you briefly of my commencement. In the winter of 1868 I became interested in bees by reading the first edition of 'King's Bee-keeper's Text-book,' which chanced to fall into my hands. Next I subscribed for one of the bee papers, read Quinby's and Langstroth's books, and in March bought two colonies of bees and the hives which I thought I should need for two years, paying the sum of \$30.00 for the whole lot. The year 1869 being the very poorest one I have ever known, I had but one swarm from the two colonies I bought, and had to feed \$5.00 worth of sugar to provision the bees through the next winter. In 1870 I received enough from the bees to buy all the fixtures I wished for 1871, and a little more. So I kept on making the bees pay their way, as I had resolved, during the winter of 1869, that, after paying the \$35, I would lay out no more money on them than they brought in, believing that, if I could not make the three colonies pay, which I then had, I could not three hundred."

"Did you stick to that?"

"Certainly; and in the fall of 1872 I found that I had an average of 80 pounds of comb honey from each colony I had in the spring, which was sold so as to give me \$559 free of

all expense incurred by the bees, except what time I found it necessary to devote to them."

"Whew! can bees be made to pay as well as that?"

"Probably not at the present time, as honey brought at that time from 25 to 30 cents a pound, while now that same honey would not bring more than 14 to 16 cents. You will note that I said 'probably not,' and I thus said because of the depreciation of honey in price. But while the prices of to-day are against us, yet we have made such an advance in the science of bee-keeping, and a much better variety of bees, that it is possible to obtain much more honey from the same number of colonies at this time than it was in the early seventies."

"Excuse my breaking in on you. Go on with your story."

"The next year I purchased an extractor and set apart a single colony to be worked for extracted honey. When the basswood bloom opened I hired a man to take my place in the hayfield, paying him \$1.75 per day. The man worked sixteen days, and I extracted during those sixteen days, honey enough from that colony which sold for some 70 to 80 cents more than what I had to pay the man in wages."

"Whew! again."

"I told you this only to show that one colony of bees properly worked was equivalent to myself or yourself in the hayfield; yet many a beginner who has purchased fifty colonies of bees, as you proposed, has left them to go into the hay and harvest fields, or at their other business, only to go out of the bee business a year or two later, telling us and those about them that bee-keeping does not pay. By starting at the foot of the ladder, as it were, working your way up, you will learn these things as you would not were you to start at the top, when in all probability you would work your way down, if you did not fall down. I believe it takes more skill to become a bee-keeper that is worthy of the name than it does to do the ordinary work on a farm."

"Then must the bee-keeper be tied to his bees every day, and all the day long?"

"No. You must learn to tell just when the bees need your attention and when they do not, by a thorough understanding of their workings, coupled with the same thorough understanding of your location as it applies to the bees. Then, when the bees do not require any special attention they can be left, and the apiarist do other work, or play if he likes; but the bees must not be neglected for a single day, when that day will put them in condition to bring dollars in the future, if you and I are to be successful bee-keepers."

"Excuse my breaking in on you this second time. Tell me more about how you got along with the bees."

"My diary shows that, in 1874, my honey was sold so as to bring me \$970, free of all expense from the bees, not counting my time, and now I began to think of giv-

ing up the farm, but finally concluded to hold on to it one year more, to make sure that I could make bee-keeping pay as a specialty. After deducting the expenses of the bees from the sales, I found that I had the next year (1875) the amount of \$1431, and hesitated no longer, but gave up farming and embarked in the bee business, with nothing else as a source of revenue. Since then the profits have varied according to the seasons and the prices obtained; but in figuring up a few days ago I found that the average since 1875, or for the past 28 years, has been about \$1045 each year, free of all expense incurred by the bees; or, in other words, that has been my salary which the bees have paid me, with an average of about 75 colonies in the spring of each year."

"Do you spend all of your time on so small a number of colonies?"

"No. In the early eighties I kept from 200 to 250 colonies for a year or two; but the long continued sickness (five years) of my father, and his death, brought new cares upon me; and, having other irons in the fire, I was obliged to reduce the number of colonies kept."

"I see I must soon be going, as it is getting late. Tell me in a few words just what your advice to one contemplating going into the bee business would be."

"My advice to you, and all others who think of trying bee-keeping as a business, would be, procure from three to five colonies of bees: post yourself by reading about and experimenting with them, as you can find time to do from the business you are already in, and thus find out for yourself which you are adapted to, and which is the better for a livelihood—the business you are already in, or keeping bees. If successful, after a series of years you can give up your other business if you wish to. On the contrary, if bees are a failure in your hands, then you will be but little out for having tested your ability in that direction."



THE Arkansas Valley Honey-producers' Association has now organized with a capital of \$5,000, with headquarters at Rocky Ford, Colo.

"THE WONDERFUL WAYS OF HONEY-BEES."

THIS is the title of an interesting article in the Cleveland *Leader* for Nov. 29. It seems that a reporter had visited the veteran, J. B. Hains, of Bedford, Ohio, and from him gleaned some interesting and valuable matter on the subject of bees in general. So far as I have read, the facts stated are

mainly correct. The *Leader* is probably only one of the syndicate papers publishing it; and if so, this article will have a wide publicity.

OUR INDEXES.

By glancing over the indexes of the various departments covering the entire year one will get a pretty fair idea of the immense amount of matter we give to our subscribers for \$1.00. These indexes are very carefully prepared, and we believe they will prove to be of great value to the careful student of bee culture.

THE NATIONAL ASSOCIATION FORGING AHEAD.

THE National is fast reaching the 2000 mark in membership. Mr. France is to be congratulated on the energy which he has put into his work. I do not believe the bee-keepers can do better than re elect him. So far as I know, there is no other candidate in the field. So long as we have so capable a man for the office we don't need a rival for the position.

BEE-PARALYSIS EASILY CURABLE.

IN preparing the index for 1903 I was greatly surprised to see the number of cases during the past year of the successful use of sulphur for curing bee-paralysis. These, coming from time to time, did not attract my special attention; but the fact that so many of them confirm O. O. Poppleton's observations all through is somewhat significant. Indeed, I think we may safely conclude that the once incurable disease is now easily curable. The *American Bee-keeper* has our thanks for directing our attention forcibly to this fact.

MOVING BEES A SHORT DISTANCE IN WINTER.

We are asked a great many times during the year how to move bees a short distance, say 15 or 20 rods. Sometimes it happens the bees are too near the highway, and it is desired to move them from the front yard to the back, or to a little grove near by. The question is, how to get them over to the other spot. While, of course, they can be moved any distance in summer greater than $1\frac{1}{2}$ or 2 miles, they can not be readily moved a short distance without some loss and inconvenience. During the winter, however, you can move them a few rods without any difficulty. Put the hives in the cellar, and in the spring put them where you like. A confinement of six weeks in chaff hives outdoors during the cold weather ought to put the bees into condition where they will stay in the new location if they were moved before they had a fly.

FRAMES SUPPORTED ON NAILS.

MR. HUTCHINSON describes what he considers an excellent method of frame support used by Mr. E. B. Terrill. The projection of an ordinary hanging frame is cut off,

and in lieu of it a six-penny finishing nail is driven into the frame about half an inch below its top. Mr. Terrill has tried it one season, and is very favorably impressed with it. I tried this arrangement myself, but found that the nails would break out or make the hole egg-shaped sometimes when the frames were heavily loaded with honey. Then I did have just the difficulty Mr. Hutchinson fears—that the frames would not hang true. But perhaps I didn't try the arrangement long enough; but I recall that several have spoken of using this device; but, if I mistake not, they sooner or later abandoned it. If not, will they please let us hear from them?

COVERS FOR HIVES; WHY THE OLD FLAT
CLEATED COVER IS NOT NOW FUR-
NISHED.

IN the November *Review* Mr. Hutchinson says, "A plain board for bottom and cover, with cleats at the ends to prevent warping, is all right for a large majority of localities. It is exactly what I should choose for this locality." I agree with him exactly. There is nothing better than the old flat cover; but his inference is that such a cover is cheaper than some other of more complicated construction. The fact is, clear wide boards in sufficient quantities to care for the trade for such covers can not be bought at any price. The big pine trees are nearly all gone. Manufacturers have simply been *compelled* to adopt a roof covered with paper or metal or some form of three-piece design that would permit of the use of one or more narrow boards spanned by a ridge-piece to close up the cracks. Such boards are readily obtainable at a moderate price because the small trees are not all cut out yet.

CANDIED HONEY; SOME THINGS WE NEED
TO KNOW.

ON page 326 of our issue for April 15 appeared an editorial on the subject of the candying of honey—what we do and do not know about it. At that time I asked for more information, and especially about stirring—how much of it would cause honey to granulate, etc., but received almost no response. Now that many bee-men are trying to put up their extracted honey in paper bags, it is a matter of supreme importance to know how to make their liquid product assume a solid condition as rapidly as possible.

At our Chicago office our honey-men are conducting some experiments along this line; and we suggest that our readers do some experimenting also. I will pay \$10.00 for the best article on this subject.

In Colorado it is no trick at all to make alfalfa honey granulate; and it may be said that the problem is easy enough in the East in the winter. Yes, but it will not candy *fast enough* or *solid enough* in many cases, I fear, to make the putting-up of honey in paper bags a commercial success.

Many facts have already shown that stirring greatly hastens the process of solidifying. Let us have some facts from actual experience. A knowledge of how to keep honey indefinitely in a liquid condition, in a freezing atmosphere, sealed and unsealed, and also how to make it turn solid, is something that bee-keepers need at the present time.

HOW TO KEEP HONEY INDEFINITELY.

MR. CHARLES WEBER, son of C. H. W. Weber, of Cincinnati, told me that it was no trick at all to keep all honey except alfalfa liquid indefinitely under all conditions. The temperature must be brought up to 145 Fahr., and kept there continuously, without variation, for 36 hours. That is the whole secret. "But," said I, "will this not darken the honey?"

"No, sir, if you do it right. *Long heating, continuously* applied at a *moderate* temperature, is much more effective than a high temperature for a short time. The latter spoils the flavor of the honey, as well as darkens it, while the former leaves it with its original delicacy of flavor, and with no darkening of color."

He emphatically stated, however, that his formula would not apply in the case of alfalfa. He could liquefy it, of course, but it would not keep in a liquid condition nearly so long.

This is a very interesting and profitable subject for discussion, and I should be glad to hear from our subscribers. Some of us, as I have pointed out elsewhere, desire to make their honey candy, and candy hard, in a short space of time; but the rest of us—and I presume a great majority—desire to know most of all how to keep it in a liquid condition so it will not "turn into sugar," in the language of their customers, thus bringing up the hue and cry of adulteration.

GIVING THE PAGE NUMBER.

IF our correspondents would invariably, in referring to something that has been previously written, mention the page or the issue of the matter under consideration, it would not only facilitate reference, but enable one to find all the places where that subject is discussed in any given volume by finding only one index page. It is not always possible to cross-index in such a way as to give all the pages on any one subject. Dr. Miller, in his *Straws*, is a model in this respect, and I wish that all our correspondents would follow after him.

To illustrate what I mean, let us take an example. I wish to know what is said about queens being stung when balled, as I wish to write an article on that subject. I look under the head of "Stings," and do not find any reference. I look under "Ball-ing," and do not find any thing there. Finally I turn to "Queens," and, looking down the column, I see "Queens Stung in Ball," and only one reference. I turn to the page indicated, and there find what Dr.

Miller has to say, and that he refers back to something previous, giving the page where it is found. Some one else in a like manner indicates another page, and so on. The one reference in the index enables me to find every place in the volume where that particular subject is discussed.

Our index is very voluminous; and even now it is not possible to give a page number to every little subject, tracing it out in all its phases clear through the volume. If, then, our correspondents will be careful to give the page in every instance it will greatly facilitate back reading, and enable one to get a birdseye view of the subject during the year past.

THE COMB-HONEY CANARDS; THE NEED OF A NATIONAL PURE-FOOD LAW; "SENATORIAL COURTESY."

RECENTLY a friend of mine happened to mention to some other friends in Cleveland that he was going to Medina.

"Medina? Medina? Why, that is the place," said these acquaintances, "where they have a factory for manufacturing comb honey. Going down there, eh? Well, tell us all about it when you come back."

So the comb-honey lie bobs up here and there in one form and another, and one can readily see why the Root Co. feels like chasing it down to its last analysis. It is generally known that there is a big beehive establishment in Medina; and the unsophisticated public in general have heard the numerous canards that have been set afloat, and conclude, as a matter of course, that comb honey is manufactured here. We Medinaites are not very well pleased with this kind of reputation; and if there were laws by which we could get hold of some of these people who are so persistently circulating these lies we would make it warm for some one.

If this were all we could stand it, but I believe it is true that many people in the cities believe that comb honey is manufactured—that very little of it is genuine. You can scarcely run across a person who has not read these stories; and, on the other hand, you can not find one who has read the denials of bee-keepers that we have caused to be published. The lie goes on being credited, while truth is smothered. Verily the task seems hopeless.

Some day when we get a national pure-food law, perhaps consumers will believe that the beautiful honey they see in the market is not manufactured. One great remedy for this deplorable situation is for the bee-keepers of the country to make a united demand on their congressmen for a pure-food law along the lines of the Hepburn bill that has been up a number of times, was finally passed by the last House, but which was shelved and pushed aside in one way and another, all because of "Senatorial courtesy," and because our national Senate refuses to adopt some measure whereby the filibustering of a very

small minority can be stopped. Some day the people will rise up in their wrath, and elect only Senators who will carry out the will of the people. They are sick and tired of the talk-to-death rule in the upper House. The action of the Senate, or, rather, of a despicable minority, regarding some very necessary, almost indispensable, laws is aggravating beyond measure.

AIKIN'S CANDIED HONEY IN PAPER PACKAGES.

JUST now I saw our folks have some very pretty little 2-lb. packages of the above in our department where we retail honey. They are getting 25 cents each for these 2-lb. packages—12½ cents per lb. for honey done up in paper! Said I, "Why, this is more than you get for honey put up in glass."

"Yes, that is so. We get only 11 cents per lb. for honey in glass jars, jar included."

This means there is a full pound of liquid honey sold for 11 cents, and the glass thrown in. We do not sell liquid honey the way they do *glossed* comb honey. When I remonstrated because they are getting more for honey in a cheap paper package than for that in a nice self-sealing glass jar, the reply was, "Well, the paper package is a new thing; and, besides, Aikin's honey is of extra quality."

Now, friends, the great point right here is, can other bee-keepers all over the world put up honey in paper packages and have it nice, dry, and clean? Why, there is not a cleaner-looking package in the groceries than these 2-lb. paper packages of candied honey. And right here the impression comes to my mind that perhaps Aikin drains off the sticky inferior liquid portion of his candied honey. I did the same thing thirty years ago, and I have done it this past year. The best way in the world to improve the quality of *any* liquid honey is to put it out in the cold and get it to candy if you can. Then put it in a strainer, or break it up in chunks so as to drain out (in a warm place) all the liquid portion that seems reluctant to candy. After it has drained for several days, and the candied honey has turned white and become tolerably hard, melt it up gradually, not getting it too hot, as suggested elsewhere in this number, and your honey will be greatly improved in quality and color; and if you pour it into these paper bags it will candy and remain hard, dry, and white. It will also be very much thicker than it was before you drained off the watery liquid honey. Now, any honey that can be made to candy by putting it out in the cold can be refined and purified by the above process.

Just one thing more about these paper packages: Ernest seems to think they do not stand hot weather. But I am sure they will stand it almost as well as they will cold weather, if you *keep the air out*. If the paper package is not absolutely air-

tight it must be put up as the "Uneda" folks put up their goods; and this can be done very cheaply. I saw some of Aikin's candied honey last season, right in the hottest July weather, that was not bad to handle at all, except on the outside where the damp air had got to it. It was during a very warm wet rainy time.

Now, then, friends, let us go to work and not let friend Aikin monopolize this business of getting better prices for honey done up in "brown paper" than that which is put up in glass jars. Will those putting up honey in paper bags please report in regard to it—especially Eastern bee-keepers? If you can not do any better, give us a brief report on a postal card. We are sure there are such among our readers, because we have sold a very large number of these paper packages for liquid honey.—A. I. R.

HONEY-PLANTS OF ARIZONA; DENSITY OF HONEY; TEMPERATURE TO WHICH HONEY CAN BE SUBJECTED WITHOUT INJURING ITS FLAVOR; VALUABLE EXPERIMENTS.

THE Agricultural Experiment Station of the University of Arizona has just issued a bulletin, No. 48, on the subject of bee-products within the confines of that Territory. It is so good that we copy all except the tabular matter, which, to the average layman, is just so much Greek. As the tables are interpreted, and conclusions drawn therefrom by the author of the bulletin, Mr. R. H. Forbes, their omission will prove no great loss; but those who are interested in this matter can probably secure copies by applying to the station as above given.

It is stated by Indians and white pioneers that the honey-bee was unknown in Arizona until American occupation. The first swarms probably drifted in from Texas with adventurous settlers not long before the middle of the last century. In 1878, J. B. Allen brought a number of colonies to Tucson from California as a business venture; while in Salt River Valley, bee-keeping began early in the eighties.

The last census enumerates 18,991 colonies in the Territory, June 1, 1900, with a product during 1899 of 930,420 lbs of honey and 13,080 lbs. of wax having a total valuation of \$67,489.

The sources of our honey are the desert flora and cultivated crops, chiefly alfalfa. A few of the principal producing plants and their seasons are as follows:

MEQUITE (*Prosopis velutina*), April to July.
SCREW BEAN (*Prosopis pubescens*), April to July.
CATCLAW (*Acacia greggii*), May and June.
ACACIA (*Acacia con-tricta*), June.
PALOVERDE (*Parlatonia torreyana*), May.
DESERT FLORA (Miscellaneous), depending on rainfall.
ALFALFA (*Medicago sativa*), April to September.

The wild honey-plants, because of grazing animals and of wood-cutters, have greatly decreased within recent years. The area in alfalfa, on the other hand, is constantly increasing, but without a corresponding increase in honey-producing power. This is due to two principal causes: Farmers are now cutting alfalfa for hay at a much earlier stage in its growth than formerly, not allowing the plant to come into full bloom; and the alfalfa butterfly (*Colias eurytheme*) has so increased in numbers since 1895 that the honey-flow, which used to continue well into September, is now cut short in July. It is difficult to state the net effect of these changes upon the producing power of the country as a whole; but in Salt River Valley under present conditions, judging from the shipments made during the last few years, our present irrigated areas with adjoining desert tracts are pretty fully stocked with bees. Other parts of the Territory are as yet less thoroughly occupied.

The quantity and character of the nectar produced by representative honey-plants is of interest in con-

nection with the amount and quality of honey producible within a given territory. The results were obtained by selecting typical plants or areas, estimating the number of blossoms, and determining the sugars in sample of average flowers.

The figure for alfalfa is especially interesting, and corresponds roughly with such farmer's estimates of yield as "a can of honey (60 lbs.) to the ton of hay." Invert sugars vary from 1.60 to 21 times (averaging 8.6 times) the amount of cane sugar present in the flowers.

The quality of Arizona honey varies with its source as well as with its treatment and preparation for market.

The average moisture 16.85 per cent, is seen to be markedly less than that in Eastern honeys, averaging in two instances 19.39 and 18.50 per cent. This results from the exposure of Southwestern honeys before and during extraction to the exceedingly dry air of this region. With our excessive heat and dryness, evaporation quickly concentrates the honeys to a condition of ripeness which insures keeping, also considerably increasing the weight per gallon. A stern honey usually weighs about 58 lbs. in a five-gallon can, while the Arizona article weighs ordinarily from 10 to 62 lbs.

The ash is in most cases normal, with two interesting exceptions, each of them containing more than the average ash. This is probably because they are desert-flower honeys, the bloom for which, growing close to the dusty ground, became charged with dust, of which the bees did not entirely rid themselves.

Cane sugar, as compared with invert sugar, is present in smaller proportion than in the nectar of the blossoms mentioned. In the honeys analyzed it averages about one-fiftieth as much as the invert sugar; while in the blossoms examined, it ranges from about one-twentieth to five-eighths of the invert sugar. This peculiar change in character is stated to occur in the honey-stomach of the bee, in which the nectar is collected, and from which it is regurgitated in the form of honey. This transformation of cane sugar into invert sugar adds to the food value of honey, since the first result of digestion of cane sugar is to bring about just this change. Honey, therefore, in a strictly natural and wholesome sense, is a predigested food.

Invert sugar averages about 7 per cent higher than in Eastern honeys, a fact consistent with the presence in Arizona honeys of less water and non-saccharine substances. This is an important point in favor of the home product, and means a premium in intrinsic food value, of about 7 per cent over the more watery honeys of humid climates.

Other substances than those commented upon, presumably acids, nitrogen compounds and other non-sugars, average about two-fifths of the amount found in Eastern honeys. Two samples examined contained .28 and .21 per cent of albuminoid substances; while the Eastern honeys quoted above averaged .34 per cent. The presence of a small amount of acid in our samples would be consistent with their well-ripened and, consequently, non-fermentable condition.

The selling qualities of our honeys such as consistency, color, flavor, and aroma, vary considerably with both source and treatment. Wild flower honeys, especially from mesquite and the acacias, are generally regarded as the best, being very white and of finest flavor and aroma. These honeys solidify very quickly when extracted from the comb. The alfalfa honey of this region is usually darker than wild honey, or alfalfa honey made in more northern localities. Its flavor and aroma are very good, and it solidifies less quickly and completely after extraction than wild honey.

Consumers, for conventional reasons, usually prefer their honey in syrup form; and in order to liquefy the solid extracted article, the five gallon cans in which it is stored are, as a rule, placed in boiling water, requiring several hours to liquefy. This process darkens and alters the flavor of the honey, materially injuring its quality. In order to determine how to liquefy honey with the least injury, a five-gallon sample of solid mesquite honey was thoroughly mixed and divided into quart Mason jars. These samples were then placed in vessels of water heated to various temperatures, and kept there no longer than was necessary to reduce them to the liquid condition. They were then judged and analyzed, with a result indicating that the lowest temperature employed, 180 degrees Fahrenheit, affects the qualities of the honey least. Liquefaction at this temperature, however, was very slow, was not complete in 6 hours, and was not permanent. At boiling temperature, on the other hand, the solid honey was rendered very fluid in 3 hours, its color and taste being damaged, and its chemical composition changed. The lowest temperature at which quick and permanent (for 4 months) liquefaction was

secured with least damage to the honey was 160 degrees; 150 degrees give better results for quality, but the honey did not remain liquid so long.

These statements show that the prevailing practice of liquefying five-gallon cans of granulated honey by putting them into boiling water is damaging to the quality, and, presumably to the market value of the product. As long as customers demand their honey in liquid condition, it should be converted in a bath of not to exceed 160 degrees Fahrenheit; and the lower the temperature employed, the better. The necessity of doing this, however, is not entirely apparent. Pure extracted honey in this region always granulates, particularly in cool weather; and the granulated condition is evidence of its purity. The usual adulterants, sugar syrup and glucose, tend to keep honey in liquid form. The fact being known, customers, especially where honey is liable to adulteration, should prefer their honey, evidently pure, in solid form. The marketing of solid honey requires packages which permit free access to the contents. Barrels for bulk and wide-mouthed cans and jars of the style now much used to contain semi liquid products, would be suitable for the marketing of solid honey, excepting in the latter case that the cost would prohibit. For retailing small amounts, a recent device consists of a bag of stout paraffined paper, into which the newly extracted honey is run and allowed to solidify. Such a package is cheap, convenient to use, and capable of artistic decoration pleasing to the prospective customer. Commercially, it would seem that there is as good reason that honey worth 5 cents a pound, wholesale, should be bagged for retail trade as that rolled oats, for instance, at about the same price should be similarly put up for sale. The use of bags is perhaps more possible here than elsewhere, because of the unusually solid character of our honey.

The adulteration of honey, in Arizona, is not commercially possible, for the excellent reason that freight rates so enhance the price of glucose and sugar that these adulterants can not be profitably used. For instance, the average wholesale cost, laid down, of white sugar during 1902, was 4½ to 5½ cents a pound, and of a good grade of glucose was 4½ to 4¾ cents a pound; while the prices obtained by the honey associations for their product in carload lots, were from 4½ to 5½ cents.

This has been the commercial condition for years past; and while it continues, the fact that honey is from Arizona is sufficient guarantee of its purity. Water, indeed, might be mixed with an especially dry product, but fermentation would be too likely to punish such dishonesty.

In brief, therefore, it appears that Arizona produces a limited amount of superior honey, containing minimum moisture, maximum sugars, very little non-saccharine substances, and, usually, of most desirable color, flavor, and aroma. This product is disposed of mostly in carload lots at low prices to manufacturing bakers and confectioners in the East, who, doubtless, are quite well aware of its value. By liquefying at too high a temperature, or by clumsy handling of the solid honey, its good qualities are often so injured or handicapped that the product is at a disadvantage in retail.

The by-products of honey are of considerable importance. Wax is sold in considerable amount, at about 30 cents a pound; and some bee-keepers work up their waste and washings into vinegar. Theoretically, one pound of average honey, worth 5 cents, should ferment to form about two gallons of three-percent vinegar, wholesaling for about 10 cents a gallon. However, the ordinary fermenting-vat employed consisting of an alcohol-barrel with open bung, requires as long as two years to complete the process; and the cost and care of barrels, delay in returns, and limited local market, discourage manufacture.

The crude honey obtained by means of the solar extractor from cappings and waste is usually fed back to the bees. On account of the excessive heat in these extractors (as high as 220 degrees F. noted by one observer) this honey is usually scorched, and unfit for sale.

STINGLESS BEES CAPABLE OF RANKING WITH APIS MELLIFICA AS A COMMERCIAL ASSET.

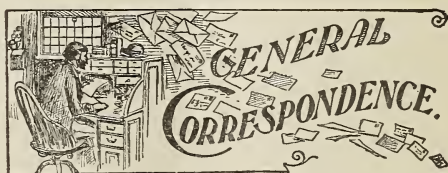
THE following is an extract from a letter received from Mr. W. K. Morrison, who has been making some investigations for us in the West Indies and South America. Mr. Morrison is, as you will see, making arrangements to ship the bees to the United

States. Of course, we shall get a shipment if possible. Further particulars will be given later.

I want to say that I now have right here the long-looked-for, come-at-last, stingless bee, capable of ranking with *Apis mellifica*, as a commercial asset. It is about the same size as *A. mellifica*, and of a fine leather color, in fact, there is very little difference between it and the leather colored Italian. If a cross can be effected it ought to produce a wonderful race of bees. The colonies can be increased by the usual artificial plan. I have no doubt they can be sent to the United States with careful handling, and I have so far progressed that colonies can be sent to New York about May 1, 1904. These bees bear domestication even better than our bees, and ignorant Venezuelans keep them without difficulty. They have been known to travelers for at least two centuries. They have never been carried outside of South America, not even to the West Indies, for the difficulty of transportation has barred the way. In Florida and the South they ought to succeed, and perhaps in the North, when we know their habits. I have been in pursuit of these bees for almost 13 years, and, in fact, beggared myself to get them; and, when about to give up in despair, here they are within the limit of civilization.

Princesstown, B. W. I.

W. K. MORRISON.



WINTERING INDOORS IN A MILD CLIMATE.

Is Noise Detrimental to Bees in a Repository?

BY L. C. ROOT.

[The writer of this article, Mr. L. C. Root, is a son-in-law of father Quinby. Langstroth and Quinby were the two American pioneers in bee-keeping, the latter being the inventor of an excellent closed-end-frame hive, one that is still used to a considerable extent in Central New York. Mr. Root was associated with Mr. Quinby during his successful work as a bee-keeper, and after the latter's death he revised his "Mysteries of Bee-keeping," a work that is still one of the standards in bee culture. In latter years, as he says, he has given up bee-keeping to a great extent, having devoted his time and interest to other pursuits.]

It is a gratification to know that his old fondness for bees has come back, for he brings with it a ripe experience of many years of successful management of bees.—ED.]

It is upon the stocks that winter well and come out in the spring strong and populous that the bee-keeper must depend for his profits. No new way of wintering should be disregarded by those who desire success.

Some experiences during the last two seasons have led me to change my views on wintering bees, and the result may be of interest to your readers.

Although living in the heart of the town I was lonely without my bees; and as an experiment I secured in the spring of 1902 a single colony, and placed it in the loft of my barn. During the season I made from this stock an artificial swarm and took 100 lbs. of surplus in sections, both colonies being left in good condition for any experiment in wintering.

The hives were placed on the south side of the stable, which is in a protected loca-

tion, affording the bees frequent flights, for in the south of Connecticut there are often mild and sunny days even in mid-winter. A fire is kept in the lower room of the stable in severe weather, and this, with the animal heat constantly radiated, maintains an even moderate temperature. The advantage of this position lies in the fact that it is a compromise between the exposure of outdoor wintering and the confinement of the usual indoor practice.

Two horses belonging to a physician are stabled directly under the hives; and as feed is kept in the loft, and all stable work done in the barn, the bees are subject to disturbance at all hours of day and night. Even with other conditions in their favor I did not believe it possible that bees could winter well in a location when they would be so continuously disturbed. Much to my surprise they came through in extremely good condition; in fact, they wintered so well that I have increased them during the present season to eight colonies, although I attribute part of my success in securing this increase to my good fortune in obtaining extremely good Italian queens to supply the new colonies.

If it can be proved that noise and jarring are not detrimental to bees in winter quarters, the knowledge may be useful to beekeepers of all classes; yet my chief motive in relating this experience is that it gives encouragement to those who, like myself, have but limited room, and can not keep bees except in a building where disturbances are unavoidable.

Of course, this is the result of but a single year and with a small number of stocks; but this fall, in addition to the eight mentioned above, I have four others which were recently given me by a friend. The latter stocks have but little honey, and must be fed during the winter, one of them depending entirely upon unsealed stores. My indoor apiary now occupies the entire south and east sides of the loft, and I am looking forward to the results of a second winter with much interest.

Stamford, Conn., Nov. 17.

[You need have no fears whatever that disturbance below will have any detrimental effect upon the bees. For several winters we have had one hundred colonies in a room beneath our machine-shop, where there was heavy machinery rumbling overhead, trucks running back and forth, and occasionally a heavy casting dropped or dumped on the floor. This disturbance keeps up ten hours a day, six days in a week, through the period of confinement. As our readers know, the bees in this shop cellar have wintered remarkably well. The consumption of stores has been very light, and the results all in all have been so gratifying that we have been seriously considering the matter of wintering all our bees indoors; for, unless we are very much mistaken, indoor bees do not consume within ten pounds as much stores as bees outdoors.

Ten pounds of syrup ripened up to about eleven pounds to the gallon will mean a saving of 60 cents per colony, for I am including the cost and fussiness of feeding. On 500 colonies that would net the Root Company \$300.

But you suggest another thing, for beekeepers located in mild climates. Indoor wintering is not satisfactory where the winter is comparatively mild; but if the bees can have a flight when it warms up outdoors, same as your bees, it does not matter how warm it gets; they can fly out, cleanse themselves, and return to the hives; and it is certainly true that for very cold snaps a stove inside of the building would be an advantage. Years ago when we were trying a house-apary on a similar plan, we found that a stove within the bee-room was too much of a good thing. The bees would feel the *direct radiation* of the heat, and warm up to an activity that would start them flying out into cold air where they would chill and die. But in your case the stove was in a *separate* room, and the direct effect of it would be to moderate very gradually extremes of temperature. Your plan of combining the advantages of indoor and outdoor wintering in your present locality would give much better results than if the bees were shut up in a cellar, the temperature of which could not be kept down to the 45 degree mark. Doubtless if you were back at your old locality in New York you would think the indoor method of wintering equally good or better.—ED]

MODERN QUEEN-REARING

As Practiced at the Root Co.'s Yards; a Brief and Comprehensive Treatise on the Latest and Best Methods, Gleaned from all Sources.

BY GEO. W. PHILLIPS.

In writing the following articles on queen-rearing I do not desire to claim absolute originality for myself or my employers. Instead of setting to work to invent a system of our own, we have endeavored to select the best points from systems already in vogue and combine them into one harmonious whole. True, here and there weak points have been strengthened, objectionable features discarded, and new additions made in order to bring the system described up to its present state of relative perfection; yet we have no desire to hang on to these improvements; and should further experience show any thing which we have described and recommended to be objectionable, or should plans be set forth by others which, in our opinion, are more desirable, we shall be perfectly willing to forego our present system and adopt and recommend the best.

PREPARING COLONIES TO ACCEPT CELLS.

The following are four different kinds of colonies which may be used to good advantage in building cells:

Queenless Bees.—In order to get a colony of queenless bees to do good work in building cells, there must be an abundance of bees of the right age and a condition of prosperity. Remove the queen; insert a division-board feeder, and replace all combs of unsealed brood and eggs with frames of sealed or hatching brood from other colonies. This serves a twofold purpose: It relieves the nurses of the work of feeding the unsealed larvæ, thus forcing them to concentrate their energies upon the prepared cells, and, besides, the hatching brood soon materially increases their numbers.

A colony with a caged queen.—Instead of removing the queen from the colony, a better way is to cage her and let her remain

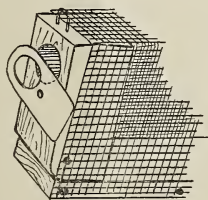


Fig. 1.

in it. In doing this, see that the tin covers the candy-hole in the cage. See illustration (Fig. 1). Five days after the cells are accepted, slip a perforated zinc cage over them as described in the next illustration, and turn the tin around so that the bees can have access to the candy and release her. In putting on the perforated zinc cage, be careful not to jar the cells. Fasten it on to the cell-bar by means of four $\frac{1}{8}$ -inch nails

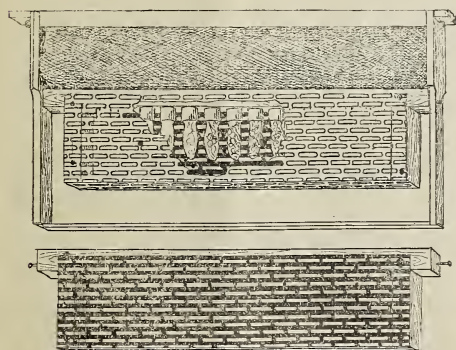


Fig. 2.

—two on each side—pressing them in with the thumb or hive-tool. Don't attempt to hammer them in, as this action will injure the cells. The perforated zinc cage could be put on and the queen released the day after the cells are accepted; but the cells will then be unsealed, and the nurses will not be able to get at them as readily. Various experiments have convinced me that cells thus caged while unsealed are likely to be somewhat smaller than those to which the bees have unrestrained access. When once

they are sealed, however, there is no danger on this score.

It may seem strange to some of the more inexperienced readers of GLEANINGS that a colony with a good fertile queen will consent to accept and care for cells; and so it may be well for me, before I go further, to notice the position that the queen occupies in the colony. This is twofold; namely, that of mother and mistress respectively (if I may be allowed to use the latter term). Wherever she has access, the production of drone comb, drones, and queen-cells will be kept under control; but whenever she begins to fail (bringing about the supersedure impulse), or she is excluded from any section of the hive by the use of perforated zinc or in any other way, the production of these in the part to which she has no access becomes a comparatively easy matter. It is by taking advantage of this fact that we have the key to the situation and are able to bring about the ideal conditions for queen-rearing at will.

The upper story of a strong colony.—The plan as recommended by Mr. Doolittle is certainly a good one. For those living in the South, where the weather is warm, and colonies can be brought up to their maximum strength easily, and kept at that for an indefinite time, the super plan should prove a success in the hands of all. I should like to have some of those who object to the Doolittle upper-story method of rearing queens see the way it works in Jamaica—see the percentage of cells accepted, and their superior quality. I make the assertion, and do it without fear of successful contradiction, that queens may be reared in upper stories, equaling in every respect the very finest reared by the natural-swarming and supersedure impulses, or any of the other methods in vogue.

A divided brood-chamber.—No one should attempt to raise cells in upper stories unless his colonies are strong—very strong. Where this condition of maximum strength is not to be easily had—as in the North, where the building-up of colonies is a comparatively hard matter, and where queen-rearing operations are often checked on account of unpleasant variations of climate—a brood-nest, divided into sections with perforated zinc, should be used. For this purpose take a hive of not less than ten-frame capacity; nail on the bottom-board, and make two tight-fitting, perforated, wood-bound zinc division-boards. They should be made to fit so nicely that, when the hive is closed, no bee can find a passage above, below, or around them. Place them parallel in the middle of the brood-nest in such a manner that the same is divided into three equal compartments—one on each side of them and one between. Each of these compartments will be capable of containing three frames. The central one is for two frames of brood and a frame of cells, and the outer two are to be occupied by the queen, she being transferred from one to the other as occasion demands.

Thus the frames will be kept well supplied with brood.

The advantages of "queen-right" over queenless bees as cell-builders ought to be plain to every queen-breeder. First, to remove queens from strong colonies means practically no honey from them for the season. Second, where queens are reared in large quantities these numerous queenless colonies become a severe tax on the rest for brood, and, besides, entail additional work on the part of the apiarist. Third, there is always danger of having the bees find some unsealed larvæ, unobserved by the bee-keeper, in the combs of sealed brood given, and over these they will undoubtedly build cells, which, if they are not discovered and destroyed in time, will soon hatch and do mischief among the good ones. This also necessitates vigilance on the part of the apiarist. Fourth, there is the risk, if only sealed brood be given, of having at some time or other to contend with fertile workers in colonies which are thus kept constantly queenless. Now, all these objectionable features are eliminated by using queen-right colonies. Honey can be stored as usual; no brood need be supplied, as each colony has a normal laying queen; no fear need be entertained of cells being started other than those given by the apiarist; nor is there any risk of having to contend with fertile workers. There are some bee-keepers, however, who never seem able to make a colony with a laying queen work satisfactorily at cell-building. These had better use one of the two kinds first described. It is unnecessary to add that all queen-rearing colonies must be fed when honey is not coming in from natural sources.

PREPARING CELLS TO GRAFT.

Every up-to-date queen-breeder is familiar, or ought to be, with the Doolittle method of queen-rearing. As soon as this is mentioned, the mind instinctively recalls lamp, melted wax, rake-tooth, water, etc. Many of us fellow bee-keepers know what it is to dip and twirl and pull off these cells hour after hour. Now, the method here described is, in essence, the Doolittle. True, it is metamorphosed, yet it is but an outgrowth of the old, and the principles involved are the same as those set forth by Mr.

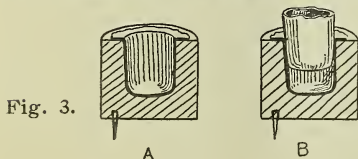


Fig. 3.

Doolittle years ago. The illustrations given in this are so self-explanatory as hardly to need comment. A represents a section of a wooden cell-cup. The hole is made in a round wooden block $\frac{3}{4}$ in. in diameter and $\frac{1}{8}$ in. long. The hole itself is $\frac{1}{8}$ in. in diameter, and $\frac{1}{8}$ in. deep, and the inside is coated with a thin film of wax.

In using the wooden cell-cup, one is relieved of the necessity of making wax cells. In it one has an everlasting cell. All that it is necessary to do in order to use it again is to trim off the out-growth after the virgin hatches, and let the bees have access to it in order that they may remove the residue of royal jelly. If they get out of shape at any time, they can be re-formed by the use of a cell-forming stick such as is illustrated in Fig. 4.

Will bees accept wooden cell cups as readily as those made of wax? When the former are kept in good order, they will. I had some doubt about the matter at the start, so did one of my assistants in the yard; and so we made a series of experiments which all proved that one was as good as the other. In the last of these, two frames of each kind were used. Upon examination we found that the first one of each kind had 10 cells accepted (14 were given), and the second had 14 each.

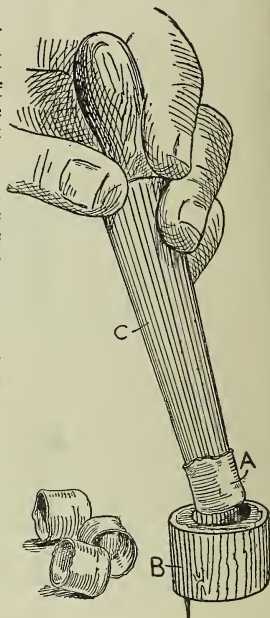


Fig. 4.

Bee-keepers are of all kinds, and very often what proves a success in the hands of one proves an absolute failure with others. There are some who will make a success in using the wooden cell cups, and others who, for one reason or another, will fail to do so. In the latter case, a wax cup can be used in conjunction with it as shown in section *b*, Fig. 3. These wax cell cups may be as frail as natural embryo queen-cells, as their base is completely protected by the block in which they are inserted. Mr. Huber Root, one of the youngest members of The A. I. Root Co., has invented a little machine by the use of which thousands of these cell cups can be made in an hour. The method of placing these cells in position is distinctly shown in the adjoining illustration. The cell-stick shown is also used for re-forming wooden cell cups as described above. The method of fastening these wooden blocks to the cell-frames is simple and effective. The projecting nail-points in the bottom of each, as shown in the illustration, serve the purpose of pinning them in position. It is an easy matter, and requires very little pressure to get the nail-points to penetrate the soft pine horizontal bar.

To be continued.

MODERN BEE-KEEPING IN ARIZONA.

Honey Production and the Making of Alfalfa Hay on a Large Scale.

BY C. K. ERCANBRACK.

I send by this mail some photos of scenery taken by myself near my apiary, now located near Lovelocks, Nevada. Figs. 1

exactly alike, and all, of course, self-spacing. These hives are in rows, facing each other, 4 ft. apart in the row, and the rows 8 ft. apart, and are run for extracted honey only. We have no swarms, so the tall trees seen are no detriment to our way of managing.

With our frames all alike, and our hives in parallel rows, and but 50 feet from our extracting-shed, one man with his Daisy



FIG. 1.—THORNE & ERCANBRACK'S APIARY OF 300 COLONIES, NEAR LOVELOCKS, NEV.

and 8 show the bees of Thorne & Ercanbrack in winter quarters for 1903. The apiary consists of 300 colonies, all in eight-frame Hoffman hives, covers and all just as made by the Root Co. The hives and frames are

barrow handles all these colonies and their crop. A boy turns the extractor, a four-frame one.

Fig. 2.—Here under these tall cottonwood trees is piled our ten-gallon extract-



FIG. 2.—TWENTY TONS OF ALFALFA HONEY PILED UP READY FOR MARKET.



FIG. 4.—THE WAY ALFALFA HAY IS STACKED ON 1000 AND 5000 ACRE FARMS IN THE WEST.

ing-cases, some 20 tons, ready to be marketed. Each can and every case has a large label thereon, informing the buyer that it is "Pure Alfalfa Honey, gathered by bees, and the same extracted by machinery," and produced in Lovelocks, Nevada, by Thorne & Ercanbrack.

The Daisy barrow, seen in the picture, has been in use two years, and has wheeled and rewheeled honey to the amount of 280,000 pounds, and is good for ten times the service it has already seen.

Another picture* shows Thorne & Ercanbrack at their apiary home, a shed made bee-tight, of rough boards, 10×15 feet. For four months our stove is a coal-oil burner; our chairs, bee-hives; our sofa, a wheelbarrow; and our beds, hammocks swung to free us from bedbugs and poisonous insects. The thermometer reaches nearly 100° each summer day; but our nights are invariably cool, and blankets are always necessary.

* This was too poor to reproduce by half-tone, and hence is not shown.—ED.

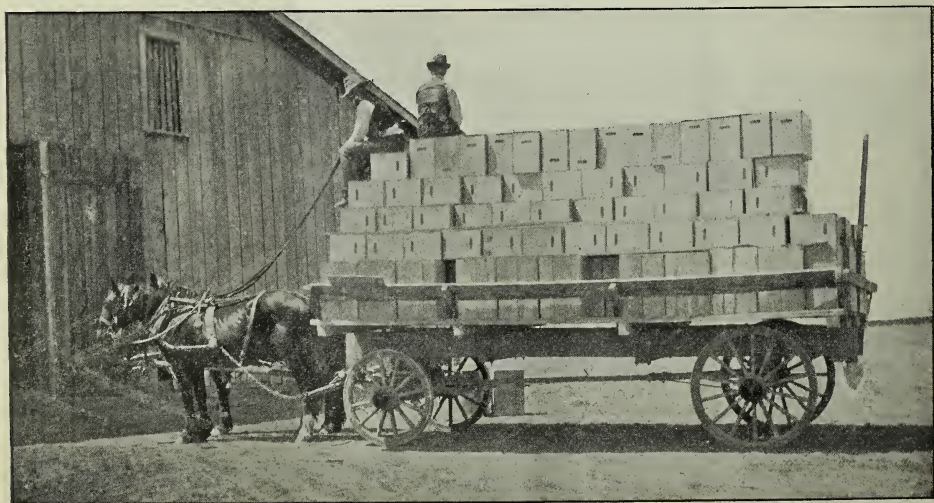


FIG. 5.—A LOAD OF TWO HUNDRED TEN-GALLON CASES ENTERING THE RODGERS BARN SHOWN IN FIG. 6.



FIG. 6.—BARN FOR THIRTEEN-THOUSAND-ACRE FARM; LARGEST BARN IN NEVADA.

Irrigating-ditches run all around us, and water is abundant for man and bees. Our neighbors are the Piutes, a friendly tribe of Indians, now nearly extinct. For enemies we have mice, bee-martins, magpies, and foul brood. Ants and moth-millers can not exist here, or do not. The bedbug, tarantula, and scorpion are more numerous than harmful, while the native rattler once in a while gets in his work and makes the use of liquor a necessity then. This is as things are.

Fig. 4 shows how the alfalfa-farmers handle hundreds of tons a day with few hands. Five men can keep five or six teams busy hauling to the stack. The load of hay is lifted at two or three grabs of a huge

fork, and raised to a height of 40 feet to a stack, and there placed in proper position. These stacks of alfalfa hay are, many of them, 400 feet long. One now in place is 900 feet long; and when the negative I made of it is printed I intend to send you a copy. These hay-handlers become expert, and command high wages. Three dollars a day was paid to some this season.

Alfalfa hay is in good demand here. It sells in stack, loose, at \$5.00 to \$6.00 a ton; and as three crops are raised it is a mint to the raisers, for it grows for twelve to fifteen years without reseeding. It is cut one day, raked the next, and is in the stack in less than a week.

Figs. 5 and 6 show the largest barn in



FIG. 8.—A NEAR VIEW OF THE THORN & ERCANBRACK APIARY, NEAR LOVELOCKS, NEV.

Nevada, probably. It covers nearly half an acre, and protects the farming tools, and houses the grain of a 13,000-acre farm. It is a rude affair, but substantial, and under its cover we stored our one thousand ten-gallon cases this season. It belongs to the farm of Arthur Rodgers, a San Francisco attorney who engages in rural pursuits while poring over legal lore. The hay-wagon entering this barn contains some 200 ten-gallon cases, and perched thereon are the apiarists before mentioned.

Fig. 7 shows the lively up-to-date city of Reno, Nevada, as seen from a hill back of the residence portion. The Truckee River is seen in the foreground. The smoke from two trains, passing as the writer was pressing the bulb, can be seen at either end of the view. Reno is the principal city in the State, although not the capital.

Watsonville, Cal.

[This collection of pictures gives a fair idea of bee-keeping and alfalfa-growing in the irrigated regions of the great West. I



FIG. 7.—THE RESIDENCE PORTION OF RENO, NEVADA. TRUCKEE RIVER IN THE FOREGROUND.

have seen dozens and dozens of ranches a good deal like that shown in these views; but I regret that I have not seen as many nicely arranged apiaries in new well-painted hives as appear in these pictures. Thorne & Ercanbrack are to be congratulated on their excellent system, their fine location, and their resultant crops of honey. It makes us Easterners almost wish that we could go out and squat right down beside them. But that would be wrong, morally and practically; no tenderfoot could go into these fields and divide the profits (the honey) without ruining the business of the original resident bee-keeper, and at the same time ruining his own chance of making any money. The only way for a tenderfoot is to go to some locality soon to be opened up to irrigation, and get on to the field before some one else does, or buy a bee range, providing he can have the assurance that somebody else would not come and steal what he has paid for.—Ed.]

DRONE COMB IN SHAKEN SWARMS.

Why the Bees Build Drone Comb.

BY M. A. GILL.

Mr. Root:—I see quite often that some writer advises against the use of starters, claiming that it can not be done without filling the hives with worthless drone combs. Now, I practice forced swarming; but when I make a swarm I make a rousing big one, and usually hang over one or two frames from the parent hive that are filled with honey, larvæ, and eggs, so the queen does not get any immediate relief from those combs. I am not one of those who believe that bees *prefer* to store honey in drone comb, and I think the facts will bear me out.

Who has not noticed that any time before swarming, and after a colony has become quite prosperous, if a frame with starter only is given either at the side or in the center of the cluster, the bees will almost invariably build drone comb? It is not be-

cause the bees need the room to store honey, but it is because they, true to their instinct, want drones, as they intend, perhaps, to swarm later on. The time is ripe for them to do so, and they will build at least three-fifths drone comb in all the room you will allow them to have at this time. They do it because they want drones, not because they prefer it for storage purposes. Now, take this same colony that is building so much drone comb. It may, perhaps, have cell cups with eggs in (but it matters not if it doesn't), and shake it into an empty hive; hang in one frame of eggs and larvæ, and hang in frames with only starters, and see what the bees will do.

These bees have swarmed, and no one knows it better than they do. They have a fertile queen, hence no use for drones; but they want workers for the season's work, and the same bees that were so persistently building drone comb last week are now just as persistently building worker comb, and

will continue to if the flow is good, until the body of the hive is full of comb, which it will be in from eight to ten days, and 95 per cent will be worker comb; and if the queen is a good one, from five to seven of these combs will be well filled with brood. The time is ripe for raising workers, just as last week was for raising drones. Of course, this swarm was given the super off from the old colony at the time of making that was full of bees, bait-combs, and full starters; so if they needed storage room they had it.

Friend Morrison, in criticising my plan, tells how much better I would like his plan of using a half-depth story filled with wired foundation; then, he says, in four or five days they are ready for a super. I will ask Mr. Morrison to go with me while I make a swarm, and bring along his little half story to put the swarm in.

Here is this pair of hives. They are eight frame hives, full of bees from the bottom-board to the top of the super, and I will warrant the two have fifteen frames of brood. One colony is very nearly ready to swarm, and the other has eggs in the cell cups. I am going to shake all the bees from both colonies into one, and take the queen from this one with one frame of brood to give the new swarm. Say, Mr. Morrison, you will have to set that little "rigin'" of yours to one side. It's too much like "baby bee-keeping" for me, for it won't hold half of these bees. Hand me that eight-frame hive with a full set of starters only, and remember there are two supers full of bees at work in the sections to go on top of this; yet you see my swarm is ready for the super now instead of waiting three or four days. When I come here again in six days it will need the third super.

Say, Mr. Morrison, isn't that swarm a whopper? Do you know I think there are 75,000 bees? Yes, they will be all settled down to business like a natural swarm. You see they got well mixed and daubed when I shook them. No, there is no danger of their going off. They won't go without a queen, and she can't go unless she goes on foot, as she is clipped.

You see, I have set one of those old hives of brood on top of the other, right behind where the pair sat, and facing the other way. When I come again in six days I will shake a lot more bees into this one from those old combs, and face it around here where it belongs. Next time I come around I will work all the brood into one hive, and put on a super; then I have the other hive to use somewhere else. No danger of this one swarming, and this colony will be just as good as Jumbo there the last half of July and all of August, at which time of the year our best surplus-honey season comes.

No, I don't do this with all my bees, but I do it with a great many when I don't want any increase.

Longmont, Col., Oct. 24.

[I have just read portions of your communication to our Mr. Phillips, who has had much experience in producing extracted honey in Jamaica. According to his experience bees will build drone comb after a swarm is shaken, about the same as before; that in the case of a young queen they are less inclined to build drone comb, and are less inclined to swarm. But he thinks he could not get along without full sheets. Mr. Morrison, who lives in a tropical country, finds his experience to be about the same. Is it not possible and even probable that local conditions have a great deal to do with this question?

Surely Mr. Morrison would not attempt to hive one of your double-decker swarms in a small half-depth brood-chamber. One who uses these chambers must, in the case of large colonies or swarms, use enough more of them to provide sufficient cubic capacity.

As I understand you, you think bees build drone comb because they want drones; but is it not also true that they also build drone comb because they want room?

Here is an article from Mr. Shepherd, which would seem to show quite clearly that bees build drone comb because they want room.—ED.]

DRONE COMB—WHY BUILT.

In reply to a footnote on page 841 I will say that the reason for so much drone comb in our hives is this. When our honey-flow is on, a good colony of bees will increase the weight of their hive from 10 to 14 pounds per day. Now, if there is any comb to be built it will be store or drone comb, no matter whether you use light, medium, or heavy brood foundation. If the flow should not come with a rush, or if it should let up, the bees would build mostly worker comb. Say, *does* drawing the wires too tight in our frames cause the foundation to buckle? I mean where we use horizontal wiring. Now, if you are really sure that the wires drawn too tight *are* the cause, just make the end-bars of the frames $\frac{1}{8}$ or $\frac{1}{4}$ inch thick, and try them, and see if buckling foundation is not a thing of the past. The end-bars, only $\frac{1}{4}$ inch thick, are too light. When you pull the wire tight, the end-bars spring in as the bees keep adding weight. The end-bars spring in more and more; and how can buckling be helped? The wire *slacks*, and that tells the story. This is how it works with us. I lay no claim to its being the same all over the world, for the world is a large place, and conditions vary. Rules and regulations that work well on a New York or Rhode Island hilltop may not do so well in a Florida swamp.

Marchant, Fla.

M. W. SHEPHERD.

[Thickening the end-bars might help the matter to a certain extent; but is it not this, after all, a rather expensive expedient? A better way is not to draw the wires too tight.—ED.]



Dear readers of GLEANINGS, I have some good news for you—yes, something that is worth more than honey or money or worldly possessions or any thing else. I am not exactly sure that we shall *all* rejoice, but I am sure we *all ought* to rejoice.* In the first place, I got hold of a letter from Bro. York, of the *American Bee Journal*, that he did not expect would ever be printed. I do not know but he will scold a little when he finds I have put it in GLEANINGS; but when he sees the good that is coming from it, I am sure he will say his old friend A. I. Root was right after all; and I do not know but it would be a pretty good idea for a lot of us to have a little experience meeting, or class meeting, as the Methodists call it, and shout praises to God for his great and wonderful blessings. The letter is as follows:

Dear Bro. Root:—I must tell you that E. Whitcomb, of Nebraska, has been soundly converted—tobacco and the rest cleaned out. He's praising the Lord, and teaching a Sunday-school class. We ought to rejoice that a man like Whitcomb has yielded to the pleadings of the Holy Spirit. I wish you would have him write his experience for GLEANINGS. It is interesting—yes, would be full—and might help some other bee-keepers who ought to follow the same course. All honor to Bro. Whitcomb for taking this stand, and also for erecting and maintaining a family altar. He is not a man to be discouraged easily, so I know he will be faithful and win his crown at last.

I just thought I'd write you about this, as perhaps you didn't know it. It's too good to keep.

Sincerely yours, GEORGE W. YORK.

On receipt of the above letter† I immediately wrote to friend Whitcomb, telling him that I especially wanted something for the Homes department of GLEANINGS, if it was all true, and he felt like giving it. Now, please do not imagine that Bro. Whitcomb is a very bad man, from what has been said. On the contrary, he has a wide circle of friends; has filled honorably many very important places in the affairs of his State, and, if I am not mistaken, in the affairs of the nation. He occupied a very responsible position at the Omaha exposition, and, I think, was also president of the convention held there at that time. Few men at the present time wield a more powerful influence among the people than Bro. Whitcomb.

Now read the letter below; and may the Holy Spirit bless the message that Bro.

*In fact, the Bible tells us there is joy in the presence of the angels of God over such news as this Home Paper contains.

†Dear friends, this footnote is *supposed* to be said to you in Bro. York's absence. The editor of the *American Bee Journal* may make *mistakes*; but after reading the above confidential letter, can you not all agree with me in saying that Bro. York *means* to do right? He means to be fair and just toward all; and may God spare him and bless him in working on the pages of the only weekly bee-journal in America. May God bless him in his faithful efforts year after year, month after month, and week after week as he works for the best interests and good of us all.

Whitcomb seems glad to bring to us each and all; for it is the finger of God that has done this, and not the work of man.

Dear Brother Root:—Yours of the 21st received, and in reply I will say that, bless the Lord, the news you have received at Rootville was true; yes, better than that. I bear within my heart the witness of the Holy Spirit that I am my Lord's and he is mine. I should fall very short of my duty at this time were I to fail to bear testimony of his loving kindness in this matter. While I am feeling sad over the fact that almost a lifetime, crowded with splendid opportunities, has been lost for God, yet I have before me the parable of the man who came at the eleventh hour, who also received his penny; and I am determined at this time, as God has been so very good to me, and inasmuch as I am at this time in perfect health, without an ache or a pain, that I will do what I can to compensate for the time which has in a measure been worse than wasted.

I bless God this morning that I had a praying mother whose prayers have followed me all through life; and I bless God for the praying mothers of America.

My conversion came about in this way: The Olivers were holding a series of meetings at this place, and in company with a sixteen-year-old adopted daughter I attended, more out of curiosity than otherwise. We had been quitting the meetings as soon as the preaching was done; but one evening as we passed out of the tent and down the sidewalk the choir began to sing that familiar hymn,

Just as I am, without one plea,
But that thy blood was shed for me.

I had heard this hymn hundreds of times. I heard but these two lines on this occasion; but they sank deep into my heart, and something kept repeating them to me all the way home; and during the night that followed whenever I awoke, and that was possibly a hundred times, these two lines were ringing in my ears, and continued to, until I got down on my knees before God and prayed, "O Lord, be merciful to me a sinner." Oh how abundantly God did bless me when I uttered this prayer of the publican! I have repeated it many times since, and received God's blessing as frequently as I have uttered it.

And again, I have another thing to be thankful for. Preparing myself for God I have left off the use of tobacco, which I had used faithfully for fifty years, and a great deal of the time used as much as a pound a week. O my dear brother, I have so very many things to be thankful for that I do not know where to begin to enumerate them. God knows the desires of our hearts, and he will be able to sort them all out in his own good time. I have gone into harness, and am teaching one of the most interesting bible classes here in Friend that I have ever been connected with; and in the study of these lessons, in explaining them, God has greatly blessed not only myself, but there frequently comes up from this interesting class a fervent "amen." Oh what a character David was! How near he seemed to get to God! and when he had sinned against God and his fellow man he did not do as many have since done, get as far away from God as possible, and go on committing other and greater sins, but he got right down before God and asked his forgiveness. And how willingly God has responded to his supplications! Here is a character which in many ways is worthy of emulation. David possibly did not have the Christian light and influence that we have in our day and age. This was many years before our plan of salvation had been worked out through our Lord and Savior Jesus Christ, and David possibly did not live in the light that we now have. And the Bible—what a wonderful book it is, as revealed to me under this new light and the blessings of God! How it is filled with blessed promises! and how prominent these promises stand out! and how many new things we are able to discover in them as we peruse them over and over again! and I bless God that he does interpret his own word to us whenever we get ourselves under the light which he has shed thereon.

While I pray God that he baptize my heart with the Holy Ghost, and feel that he from day to day is answering my prayers, often with the measure running over, yet I beg an interest in your prayers as well as in the prayers of all professed Christians, that I may ever be faithful.

By this time you are doubtless asking what became of the daughter. She has not been found wanting, and we bow together daily around the family altar, and our names are inscribed side by side upon the church-roll. There are yet others who are near and dear to us who are out of Christ; but as God does hear

and answer prayer it will be well with them in his own good time; and my faith reaches up to that blessed time when there will not only be joy in heaven but in my heart.

I thank you heartily, Bro. Root, for your nice and consoling letter. There are often times in our lives when a good Christian word fully spoken fairly uncorks the vessel which admits rich blessings to our souls, and this seems to have been one of them.

Yours for God, E. WHITCOMB.

Friend, Neb., Nov. 23, 1903.

I took the letter over to the house, and read it to Mrs. Root. Before I got through she asked how old he was. I said I could not tell; but from the fact that the dear brother tells us he used tobacco "faithfully" for over fifty years, I imagine he must be about my own age. When one reads what he says about the two lines of that hymn that he kept repeating over and over when going home, and the two lines that were all night ringing in his ears, it reminds us of what father Langstroth said about his watch that kept saying "Quinby, Quinby," all night.

I suppose our readers would like to know more about the "Olivers" and their work. Perhaps Bro. Whitcomb or somebody else will tell us more about them.

By the way, since this thing has started is it not possible that the year 1904 may usher in a great wave of souls turning to God? Is it too much to ask God that, instead of reading in our dailies about "grafting" in our great cities, and bribery and corruption, strikes, etc., we may give the papers some news in the line of Bro. Whitcomb's new birth? May the Holy Spirit bless the message as it comes to the knowledge of the bee-keepers of our land.

And now just a word to our good friend Whitcomb. If you go on in the spirit in which the above letter is written, sooner or later you are going to get some hard knocks. Satan will protest; and discouragements and vexations will come in upon you in most unexpected ways. May the Lord be praised for the fact that you are a big broad-shouldered man, and, if I am correct, not easily put out, especially when you know you are right. Hold on to that Bible promise in that longest psalm of David, "Great peace have they that love thy law; and nothing shall offend them."

On page 60 of our issue for Jan. 15 appears an excellent picture of friend Whitcomb, and it may be worth while for the friends to turn back and look at his picture while they read his letter to the readers of GLEANINGS.

REMEMBER THE SABBATH DAY TO KEEP IT HOLY.

Dear Bro. Root:—To-day was the first time I had the opportunity to read your Dec. 1st Home Paper on the question of the observance of the Lord's day. I think it is without exception, the best paper of any that I have read in over four years. If the same common-sense interpretation of the Scripture, and its application to the problems of life, were only followed by the followers of Christ, a great deal of energy that is now wasted could be better utilized in the kingdom; and if the spirit of charity with which it is saturated were only copied by all those who seek a solution of this perplexing question it would be more in accord with

the profession which we make. I think your view is biblical, reasonable, and Christlike.

Fraternally yours, JESSE HILL.

Medina, Ohio, Dec. 8.

When I read the above letter, and found it was from the pastor of our own church, I shall have to confess it was one of my "happy surprises." In fact, after the paper was written I felt so much troubled about it I meditated carrying it to him, asking his opinion about it. For want of time I did not get around to it. Perhaps I may say to our readers that the writer of the above is about as able a man, from every point of view, to discuss and give an opinion on this "perplexing question," as he terms it, as any doctor of divinity or anybody else I know of.



HAIRY OR SAND VETCH.

My trip to California during the past season prevented me from making experiments with sandy vetch, as I proposed, but I still have the matter in mind. We extract the following from the *Country Gentleman* for Oct. 22:

Many cover crops do not actually cover the surface of the soil. Soy beans and cow peas, for instance, especially when grown in drills, leave a large part of the ground uncovered. The vetch lies prostrate, and by its rapid growth very soon puts the entire surface soil out of sight. This is true even when seed is grown in drills.

This prostrate habit of the vetch, along with its ability to hold fast wherever it gets a start, makes it one of the best possible crops to prevent erosion of soil that is liable to wash. One of the strongest legitimate objections to the cultivation of orchard soils lies in the fact that they sometimes do wash away badly during the spring rains. The proper way to prevent this, of course, is by growing a good cover crop, and for this purpose we know of absolutely nothing so good as the winter vetch.

It has often been said that the fruit-grower should choose one of the leguminous crops for an orchard cover, the reason given being that, when such a crop is turned under, it furnishes a considerable amount of nitrogen for the trees.

This nitrogen, moreover, is in a very readily available form, and can be made use of by the trees with certainty and rapidity. Among all the nitrogen-gathering crops, the vetch stands possibly at the head. At any rate, it seems to get the most nitrogen, although in the question where it gets it remains an open one. In the experiments of Craig and Cavanaugh at Cornell, some very remarkable figures were developed. It was shown, for instance, that where cow peas contain an average of 52 pounds of nitrogen to the acre, the hairy vetch has secured 256 pounds.

The price of \$7 a bushel, however, is not so bad as it seems. If one sows a bushel to the acre, then it is indeed expensive, and a bushel to the acre is what has been frequently recommended. According to our experience, however, the seed can be sown in drills at the rate of one to one and a half pecks to the acre, and still give a perfect cover under ordinary conditions. This method of handling cover crops is one concerning which we will have more to say at some future date.

Accompanying the article in the *Country Gentleman* is a beautiful picture of a field of sand vetch grown for seed.

The above figures, calling hairy vetch worth five times as much to plow under as cow peas, are pretty strong; but from what

I saw of it where it came up wild in my potato patch in Northern Michigan, I am inclined to think it is about right. I hope a lot of our friends will try it on a small scale, even if they do not do any thing more. If it grows as it did up there, a peck to the acre would certainly be ample seeding. I should like to know what kind of a crop of potatoes it would produce if turned under in June, in full pod and blossom.

The following is from our friend Greiner, in *Farm and Fireside*:

In one respect the winter (or hairy) vetch has proved a disappointment to me. It blooms fully and freely—in fact, it has been a mass of bloom beautiful to look upon all season long and is still blooming; but it does not set, and there will not be enough seed to reseed the ground after the present crop is gone. So if I want another patch (and I expected to plant a larger one this year) I shall again have to depend on the seedsmen for the seed, and pay about \$6.00 or \$8.00 a bushel for it. Possibly the plant may produce seed more freely in the colder portions of Canada than here. As an orchard cover-crop, however, this vetch will be hard to beat. It makes a dense mass of green stuff early in the season. Now that the stalks begin to die out and decay, I find the soil underneath nice, spongy, moist, and soft, and the weeds thus far kept down or choked out. There is no question in my mind that when the vetch crop has died down, the soil will be in better condition than before.

At our place in Northern Michigan it produces seeds in the greatest profusion. In fact, there are so many little seeds that it seems to me they must be valuable as feed for stock. I notice some of the seed catalogs are offering the seed at \$8.00 per 100 lbs.

THE SILK INDUSTRY OF BELDING, IONIA CO., MICH.

In one respect I am quite fortunate in my Notes of Travel; for if I make any mistakes, there are plenty of friends always ready and willing to set me right. And let me say here that one who travels with automobile or bicycle is often puzzled to know the name of a town he is riding through. On the railways we have the names of the towns in plain letters on the station buildings; and I have often wished there might be some place in every town to give its name. The following letters explain the matter. I give all three of them because each one contains some valuable fact omitted by the others.

In your account of recent trip through Michigan you give to Greenville, Montcalm Co., credit for the "beautiful large factories producing silk, etc." You were entirely mistaken as to the locality. The "silk city" you saw was the city of Belding, Ionia Co., my market town. There are three large silk-factories, employing about 400 girls each, and several other (wood) factories employing about 1000 men. We consider this Belding of ours the future five big town of this section. The silk-dealers of New York and Chicago, Belding Brothers and Richardson, have their headquarters here; and whatever silk thread you see with their names on is made here. The Belding Brothers several of them, were born and raised on a farm just north of the city. HARMON SMITH.
Orleans, Mich., Nov. 4.

You ask for information in regard to the silk-factory in Michigan. The factory was started a good deal as you started the bee supply business, by two boys, or, rather, when they were boys they started to peddle silk thread.

They have a lot of women working for them, and their rules are such as to elevate young ladies' minds. Taking it all in all, it is one of the most refined factories in existence.

ROYAL HADLEY.

Manistee, Mich.

You spoke of a silk factory in Greenville, Mich. I would say this. I believe Greenville has no silk-factory. But in Belding, a town a few miles distant, there are three or four large factories. While visiting there last August a friend of mine took me through one of them, and it was a grand sight, well worth one's time. Mostly girls are employed—I should think at least three or four hundred.

Valparaiso, Ind.

GERNAL SLAWSON.

Many thanks, friends, for setting me right; but, true to my nature (I am Yankee born, you may remember), I am not at all satisfied with the answer to my first question. Now, where does this factory get its raw material? Do they grow mulberry-trees and raise silkworms? Years ago we sold large numbers of a little book by Nellie Rossiter, about the care of silkworms. But the matter somehow dropped out of sight, because we were told the care of silkworms had never been made a success in America. Does the material needed for these great factories come from across the seas? Who will answer this question?



Ernest is off on a vacation of two weeks, and I am taking the liberty to collect favorable reports in regard to bee-keeping from different parts of our land. I do not know how long this department will be kept up; but I do think it is an excellent idea to compare notes and let people know what is being done, even on a small scale, in the way of getting honey in all sorts of localities. Please make your reports brief, so we can get in a good many of them. A postal card is quite large enough. The first one below is a good sample, and is interesting to me because the honey crops have been mostly poor in Florida for a good many years. There is another thing that interests me particularly. Friend M. has a Florida home, and a northern one in Tontogany, Ohio. He migrates back and forth every spring and fall; and his Florida home is a very pretty place, I can assure you, for I have been there.—A. I. R.

Mr. E. R. Root:—If your father comes south, tell him I should be pleased to have him call and see me again. My bees here did finely this summer.

Sorrento, Fla., Nov. 30.

R. L. MCCOLLEY.

[Here is another:]

184 LBS. PER COLONY, AND INCREASED FROM 31 TO 36.

I send you my report this year, with 31 colonies to start with. We have waited nine years for this crop of honey. I ran 15 for comb, and got 2100 lbs.; 16 for extracted, and got 3600 lbs., or an average of 184 lbs. per colony, spring count; increased to only 36.

Rockton, Ill., Dec. 7.

R. GAMMON.

Chas. Israel & Brothers

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Oyster Shells, 100 lbs., 60c; 200 lbs., \$1. Mica Crystal Grit, 100 lbs., 70c. Wise & Co., Butler, O.

Mr. A. I. Root's Writings

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PERE MARQUETTE R. R.

For pamphlets of Michigan farm lands and the fruit belt, address J. E. Merritt, Manistee, Michigan.

FOR SALE.—Fancy basswood and white-clover honey; 60 lb cans. 8c; 2 cans or more, 7½c; bbls., 7½c. E. R. PAHL & Co., 294 Broadway, Milwaukee, Wis.

FOR SALE.—Fancy and A No. 1 comb honey from alfalfa, in Danzenbaker 4x5 sections. Write for prices. WM. MORRIS, Route 1, Las Animas, Col.

FOR SALE.—Extracted choice ripe clover honey in cases of two 60-lb cans each, at 8 cts. per lb.; 335-lb. bbls. at 7½ cts per lb. G. W. WILSON, R. F. D. No. 1, Viola, Wis.

WANTED.—Beeswax. Will pay spot cash and full market value for beeswax at any time of the year. Write us if you have any to dispose of. HILDRETH & SEGELEN, 265-267 Greenwich St., New York.

WANTED.—To sell 2007-lbs. pure white-clover extracted honey, in 60-lb. cans, at 7c per pound. N. A. KNAPP, Rochester, O.

WANTED.—Comb and extracted honey. State price, kind, and quantity. R. A. BURNETT & Co., 199 South Water St., Chicago, Ill.

WANTED.—Honey. Selling fancy white, 15c; amber, 13c. We are in the market for either local or car lots of comb honey. Write us. EVANS & TURNER, Columbus, Ohio.

WANTED.—Comb honey. We have an unlimited demand for it at the right price. Address, giving quantity, what gathered from, and lowest cash price at your depot. State also how packed. THOS. C. STANLEY & SON, Fairfield, Ill., or Manzanola, Colo.

WANTED.—Beeswax; highest market price paid. Write for price list. BACH, BECKER & Co., Chicago, Ill.

We will be in the market for honey the coming season in carloads and less than carloads, and would be glad to hear from producers everywhere what they will have to offer. SEAVEY & FLARSHEIM, 1318-1324 Union Avenue, Kansas City, Mo.

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To have the best queens in every line, plenty of them, to merit your orders by accurate mailing, delivered in good order. Prompt attention is our fixed purpose. Full colonies and nuclei a specialty. Write for catalog and prices.

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For cut of this machine, see Dec. 1 issue. **F. J. ROOT,** 90 West Broadway, New York.

PARADISE

The editor of the Bee-keepers' Review has visited nearly, if not quite, as many parts of the country as has any bee keeper, and, while he has seen several excellent locations for honey production, he has yet to see the equal of some portions of Northern Michigan. For three years he has had these regions under observation, last July spending two weeks, with camera and pencil, right on the ground, and he is satisfied that, for the next 20 years, at least, this part of the State will be a veritable paradise for bee-keepers.

The December issue of the Review is a special number, devoted to Northern Michi-

gan, nearly a dozen pages of descriptive matter and beautiful pictures showing up the bee keeping capabilities of that part of the country—a country that, in many places, is not yet stocked with bees. Why eke out a scanty living in a poor locality, when there are rich fields unoccupied?

Send \$1.00 for the Review for 1904, and you will get, not only this December issue, free, but all of the other issues of this year. In other words, as long as the supply holds out, all of its numbers of this year (1903) will be sent free to the man who sends \$1.00 for 1904. This year and next for only \$1.00.

W. Z. Hutchinson, - Flint, Mich.

Sloe Plum

Rarely offered by the trade. Stock very limited. Order before too late. Price for spring delivery, 3 to 4 foot trees, 50c each. In lots of 5 or more, 40c each. Grafting wood, postpaid, per foot 10c; 3 ft. 25c; 10 ft. 75c.
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\$5.95

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Get this ad out and send it to us. Give your height and weight. State number of inches around the body at chest, take close up under the arms, over vest, also number of inches around body at waist just above the hips, also number of inches around the body at (hips) largest part, also length of pants leg inside seam, from tight in crotch to heel, and we will send you by express this **FREE**. When it arrives at your express-office examine it carefully, try it on, and if you find it exactly as represented by us, strictly all wool, made in the latest style, for fall and winter of 1903, to be a better fitting suit, better made, more serviceable, more stylish, and better in every way than any suit you can buy of any other house in Chicago, or in fact from anywhere else, or of your local dealer at home at less than \$14.00, pay the express agent our special price of \$5.95. If the suit does not prove to be exactly what you want, satisfactory in every way, equal to suits that sell everywhere at \$14.00 to \$16.00, then ship it back to us and we will pay the express charges both ways. Understand, we do not ask you to send us one single cent with the order. All that is necessary to do is to send us this ad, if you are a subscriber to this paper, give us your full measurement as indicated above, and we will ship you this handsome suit. Do not be afraid the suit will not fit you. Take your measure carefully and the suit will surely fit you perfectly. If it does not fit perfectly, if it is not satisfactory in every way, and the biggest bargain you have ever seen, and equal to suits that retail everywhere from \$14.00 to \$16.00 you need not pay one single cent or take it from the express office but you may send it back to us, we paying the express charges both ways.

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Wear this handsome suit 15 full days. In the meantime, compare it with suits your friends have bought at home or elsewhere, and if you do not find our suit superior in quality, style and tailoring, and general make-up, and if it is not worth more than what your friends have paid for suits at \$14.00 to \$16.00, return it to us and we will refund you your money, and pay all express charges so you won't be out one single cent. **Order today and wear a \$16.00 suit at \$5.95.**

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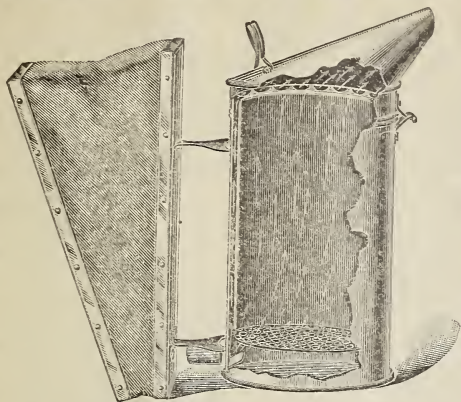
is made of a fine quality of all wool black cheviot. The coat is made in the semi-military fashion, round cut sack, like illustration; has broad padded shoulders, giving the shoulders a broad dressy effect; has double interlined canvas self sustaining front, is neatly lined with strong farmers satin, has four pockets, vest is single breasted, made in the best of manner with notched collar, nicely lined. The trousers are made full medium wide, cut over the latest pattern. This is a suit that keeps its shape, and will give the wearer the very best service. We use in this suit better lining, trimmings, interlining, stiffening and finish, than any other maker. We employ none but the very best of cutters and fitters, and we guarantee to give you a more stylish, a better made suit every way, shape and manner, than you can buy anywhere else without paying from \$14.00 to \$16.00.

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Barely covers the cost of the cloth, lining, trimmings and tailoring. We are making this special offer merely to introduce our clothing in your vicinity and to place one of our catalogues in the hands of every subscriber of this paper.

We are only able to make this extremely low price because of our extraordinary facilities for buying and manufacturing, and because of our large volume of business. **Order today, and with the suit we will send you one of our large complete catalogues; or, if you prefer a suit different from our special \$5.95 suit, as described above, with our clothing catalogue. State in your letter the kind of suit you want and we will send you samples.**

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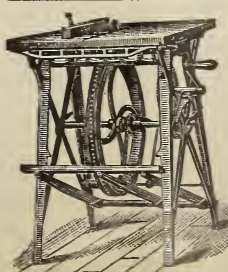
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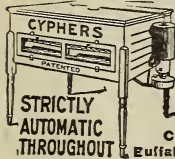


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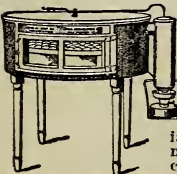
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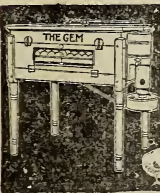
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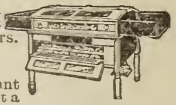
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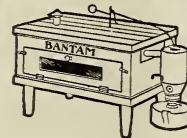
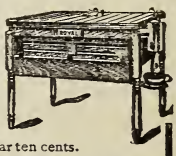
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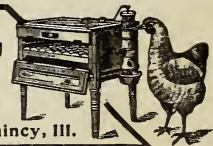
beats 'em all. One customer writes he obtained 51 chicks from 50 eggs. The Bantam hatches every fertile egg every time. Catalogue proves it—sent free.

Buckeye Incubator Co.
Box, 64, Springfield, O.

\$12.80 For 200 Egg INCUBATOR

Perfect in construction and action. Hatches every fertile egg. Write for catalog to-day.

GEO. H. STAHL, Quincy, Ill.



Get A

DANDY

GREEN BONE CUTTER and get dandy satisfaction in every way. Try it before you buy it for 15 days. If not satisfactory we'll take it back. Stratton Mfg. Co., Box 54, Erie, Pa.



THE CROWN Bone Cutter

for cutting green bones. For the poultryman. Best in the world. Lowest in price. Send for circular and testimonials. Wilson Bros., EASTON, PA.

IT WILL PAY EVERY HEN OWNER

to send and get one of **Mann's Latest Bone Cutters.** It makes hens lay and pay. Open hopper. Cuts all bone and gristle. **TEN DAYS' FREE TRIAL.** No money until you're satisfied that it cuts easier and faster than any other. Isn't this better for you than to pay cash in advance for a machine you never tried?

F. W. MANN CO., Box 37, Milford, Mass.



Gleanings in Bee Culture

[Established in 1873.]

Devoted to Bees, Honey, and Home Interests.

Published Semi-monthly by

The A. I. Root Co., - - Medina, Ohio.

A. I. ROOT, Editor of Home and Gardening Dep'ts.

E. R. ROOT, Editor of Apicultural Dept.

J. T. CALVERT, Bus. Mgr.

A. L. BOYDEN, Sec.

TERMS. \$1.00 per annum; two years, \$1.50; three years, \$2.00; five years, \$3.00, *in advance*; or two copies to one address, \$1.50; three copies, \$2.00; five copies, \$3.75. The terms apply to the United States, Canada, and Mexico. To all other countries 48 cents per year extra for postage.

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The National Bee-Keepers' Association.

Objects of The Association:

To promote and protect the interests of its members.
To prevent the adulteration of honey.

Annual Membership, \$1.00.

Send dues to the Treasurer.

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BASSWOOD-LUMBER SUPPLY.

I hope none of our readers have received the impression from various recent editorials on the failing supply of basswood for making sections that there is an actual shortage at present. If you have, I wish to disabuse your mind of such a thought. We have usually calculated our annual needs in basswood at about

1½ million feet, while we have bought during the past year 2½ million feet. We have a larger supply of dry lumber on hand, both of pine and basswood, by many thousand dollars' worth, than we ever had before. Don't you worry about our not having basswood lumber to make sections as long as there is any to be had for any purpose. The amount of basswood used by all the manufacturers of bee-keepers' supplies combined is not more than two per cent of the total amount of basswood used for all purposes, and I doubt if it is one per cent. It is the enormous use of this timber for other purposes, increasing every year, that bids fair to exhaust the supply within a few years. The constant increase in value of other woods is what stimulates the demand for basswood, and forces the price of this up as we'll. The general level of lumber prices must be sixty to seventy per cent higher than they were five or ten years ago, figuring the per cent on the prices ruling then. Some grades have doubled in price; and this advance can not be wondered at when we consider the enormous annual consumption and the narrowing limits of the available supply. There may come slight reactions in price, but we shall never again see the low level of a few years ago.

Special Notices by A. I. Root.

PRICE LIST OF CLOVER SEED, BUCKWHEAT, AND OTHER HONEY-PLANTS, ETC.

As I have mentioned before, we shall issue no list of garden seeds this season. You can get the same seeds, however, of E. C. Green & Son, Medina, O., and they will furnish you a price list. We shall, however, issue a price of seeds of honey-plants, hand p. tato-planters, strawberry-planters, etc. These will probably be ready to mail by the time this reaches you.

SEED POTATOES FOR 1904.

In view of the rapid advance in the price of potatoes, I think I must have got my prices pretty low on page 980, Nov. 15. In fact, some of them are now worth the price, \$2.50 per barrel, for table use. As it is, we are sold out of all the early potatoes except Early Trumbull, Early Harvest, Hammond's Sensation, Freeman, and New Queen. The late potatoes we are sold out of except Lee's Favorite and State of Maine. All prices after this date will be, for the early \$1.50 per bushel or \$3.50 per barrel; for Lee's Favorite and State of Maine, \$1.25 per bushel; per barrel, \$3.00.

THE HAIRY WINTER OR SAND VETCH—VICIA VILLOSA.

We have just succeeded in getting a very low rate on the seed of the above plant, so we can furnish one bushel for \$6.00; ½ bushel, \$3.25; peck, \$1.75; 1 quart, 25 cts.; pint, 15 cts.; ½ pint, 8 cts. If wanted by mail, add 8 cts. per pint or 15 cts. per quart extra for postage. I am very anxious that this new legume be tried extensively. I have never had any report from it in regard to its value for honey; but as it bears immense quantities of blossoms, something the shape of a locust-blossom, it must furnish large quantities of honey, and it begins to bloom just after fruit blossoms. We will send along with the seed full particulars, so far as we can learn, in regard to its cultivation. See articles in regard to it in this issue.

GINSENG AND ITS CULTURE.

Just now I am receiving more letters of inquiry concerning ginseng than any other one thing. The writers want to know if I would advise embarking in the industry. If so, what advertisers of plants for sale are reliable, etc.? So far as my experience goes, ginseng is the hardest plant to make grow of any thing I have ever tried. It is true it grows very well among my potatoes in Northern Michigan—that is, in newly cleared ground where the plants come up themselves. But I can not have a garden up there, because I am absent a great part of the year, and ginseng hunters are roaming through the woods almost all the time. I would not advise anybody to go into the business with the view of making money unless he expects to sell plants and seeds at the prices dealers are now asking for them. I do not know of anybody as yet who has made money by growing the roots for sale. The pamphlets and advertisements are all very misleading, and some of them are gross exaggerations. I have carefully examined the editorials of our leading agricultural papers, and they nearly all agree with me. And last of all, but not least, there is no demand for the roots for any good purpose. When the Chinese are converted to

the gospel of Christ Jesus, as I pray and believe they will be in due time, the demand for ginseng at several dollars a pound will be gone. If you wish to invest a dollar or two in plants to experiment with, all right. One man who wrote had already invested in plants and seeds to the value of \$100. Now, even if you should decide to go into the business, do not make any such investment until you have had a little experience first on a limited scale. We have two books on the subject—one worth 10 cents, and the other 50; but I have taken both out of our book-list, because I do not exactly approve of the industry. If, however, you want information on the subject, these two books I have mentioned will give you a pretty fair statement of the matter.

CONVENTION NOTICES.

The first regular meeting of the Kansas Bee-keepers' Association will be held in Topeka, Dec. 30. All persons interested in bee-keeping, whether members or not, are cordially invited to attend.
Topeka, Kan. O. A. KEENE, Sec'y.

All bee-keepers in Pennsylvania, interested in forming a thorough State organization, are requested to correspond with the undersigned.

E. L. PRATT, Swarthmore, Pa.



brings fruits and flowers. We make the right appliances. Special adaptation to every need.

HAND, BUCKET, BARREL KNAP-SACK and POWER SPRAYERS.

20 styles. Nozzles, hose, attachments, formulas, every spraying accessory. Write for free catalog.
The Deming Co., Salem, O.
Western Agents, *Deaton & Hubbell, Chicago.*

Wants and Exchange.

Notices will be inserted under this head at 15 cts. per line. Advertisements intended for this department must not exceed five lines, and you must say you want your advertisement in this department or we will not be responsible for errors. You can have the notice as many lines as you like; but all over five lines will cost you according to our regular rates. This department is intended only for bona-fide exchanges. Exchanges for cash or for price lists, or notices offering articles for sale, can not be inserted under this head. For such our regular rates of 20 cts. a line will be charged, and they will be put with the regular advertisements. We can not be responsible for dissatisfaction arising from these "swaps."

WANTED.—To sell bees and queens.
O. H. HYATT, Shenandoah, Iowa.

WANTED.—To sell strawberry-plants. Catalog free. **NORTH STAR PLANT FARM,** Kokato, Minn.

WANTED.—Second-hand Barnes machinery.
W. H. BRYAN, Roann, Ind.

WANTED.—A partner for bee-keeping on large scale.
J. J. WILDER, Cordele, Ga.

WANTED.—To sell 15 colonies of bees in 8 and 10 frame Root hives; supers and fences complete; 4¼x4¼ plain.
R. H. BURTON, Towson, Md.

WANTED.—To exchange pair Morgan horses for honey, bees, or hives.
ELIAS FOX, Hillsboro, Wis.

WANTED.—To sell at a bargain. Three incubators, one 2½ vertical engine, good as new.
G. ROUTZAHN, Biglerville, Pa.

WANTED.—A Barnes machine with cutterheads, to cut from 1½ inch to 1½ in.; two 12-in. saws, 1 rip, 1 cut-off.
G. C. CARTER, Freshwater, Va.

WANTED.—To sell 15,000 lbs. best white-clover extracted honey in 60-lb. cans, at 8½ cts. per lb.
WALTER S. POWDER, 512 Mass. Ave., Indianapolis, Ind.

WANTED.—To sell choice alfalfa honey, in 60-lb. cans. Prices quoted on application.
W. P. MORLEY, Las Animas, Col.

WANTED.—A partner for bee-keeping on large scale. Excellent prospects, never failing honey crops.
L. MARNO, Kingston, Jamaica.

WANTED.—To exchange modern firearms for incubators, bone-mills, and shell-mills. Address
216 Court St., Reading, Pa.

WANTED.—Names and addresses of those who want good books or sheet music. Ask for prices on what you want.
M. T. WRIGHT, Medina, Ohio.

WANTED.—Your address on a postal for a little book on Queen-Rearing. Sent free.
Address **HENRY ALLEY,** Wenham, Mass.

WANTED.—The address of all who are still in need of cartons.
QUIRIN-THE-QUEEN-BREEDER, Bellevue, Ohio.

WANTED.—To sell apiary of 200 colonies, and supplies sufficient for 300, with every thing needed for a well-equipped apiary.
W. J. YOUNG, San Cristobal, Cuba.

WANTED.—To sell 300 colonies of bees in 10-frame 2 story hives, and locations with buildings and stock range, deeded land in good sage range near Rincon, Riverside Co., Cal.
T. O. ANDREWS.

WANTED.—To exchange a 200-egg Reliable incubator and brooder, been used very little, for choice comb or extracted honey.
CHAS. KOEPPE, Fredericksburg, Va.

WANTED.—To buy, on short time, with good security, or to trade 160 acres of land, 16 miles north of Garden City, in Finny Co., Kan., for bees, with extracting combs.
GEO. R. WILLIAMS, Ottawa, Ill.

WANTED.—To exchange a Newcomb No. 3 Fly Shuttle loom, in good order, complete, for wind-mill and tower, etc., or any good offer.
FRED WHITAKER, New Smyrna, Fla.

WANTED.—To send handsome calendar free to those in need of first-class printing. Estimates free. 100 envelopes, note heads, or statements, 40c; 250, \$1.00 postpaid.
YOUNG BROTHERS, Printers, Girard, Pa.

WANTED.—To sell 900 colonies of bees, located where the honey crop has never been a failure. A dwelling-house costing \$2000, three honey-houses and a shop. Every thing up to date and complete. For particulars address
A. B. MARCHANT, Marchant, Fla.

WANTED.—To sell apiarian outfit of 200 colonies Italians in Dovetailed hives, in best white clover part of Minnesota (also basswood and goldenrod); to a buyer of the lot, colonies at \$4.00, and accessories at one-half list price; combs 20c a square foot.
X Y Z, GLEANINGS.

WANTED.—To exchange for a Barnes Saw, or any thing I can use in my apiary, a fly shuttle carpet-loom (Dean's), good as new; cost \$60.00 when new; will take \$25.00 cash. My bees and supply business take all my time, so I can not weave carpets any more.
E. R. FOSMIRE, Cromwell, Iowa.

WANTED.—To sell best type-writer for bee-keepers; practical, handy, low-priced. For exchange, Mann green-bone mill, good as new, cost \$16.00. Want 8-frame L. or Dovetailed hives or extracting supers for same; extracting-combs from healthy apiary; double shotgun, 16 gauge.
HARRY LATHROP, Monroe, Wis.

WANTED.—To sell my home, consisting of 8-roomed house, cistern, and running water; barn, 24x36; shop and honey-house, 18x34, and 3 acres of land; together with my bees, underground bee-repository, queen-business, and good will. My best breeding-queens go with the bees. See pp. 295, 935, GLEANINGS for 1903. Will move about 20 rods on old Doolittle homestead, and am willing to help the purchaser a month or so for the first year or two. Reason for selling, over-worked. Price \$2500.
G. M. DOOLITTLE, Borodino, N. Y.

Four Per Cent. Discount During the Month of December

Send for our 1904 catalogue and price list. Our hives are perfect in workmanship and material....

Take Advantage of Our Early Discounts

and send your orders in now. By so doing you save money and secure prompt shipments.....

PAGE & LYON

MANUFACTURING CO.,

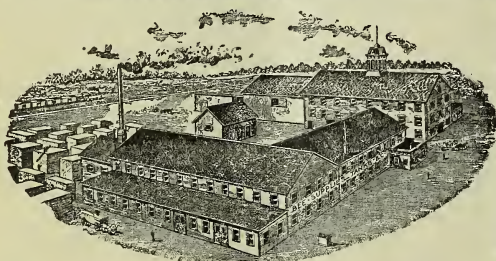
NEW LONDON, WIS., U. S. A.

We Have Not Moved.

The government, recognizing the necessity of a great and growing business enterprise, for better mail service has given us a postoffice on our premises, which enables us to change mails with the passing trains instead of through the Wetumpka, Alabama, postoffice more than a mile distant. This gives us our mails about two hours earlier, and also one hour for making up outgoing mail. This will be particularly helpful in our queen business. We are now booking orders for Italian queens, Long-tongued and Leather-colored; both good.

J. M. Jenkins,
Honeysuckle, Alabama.

Shipping-point and Money-order
Office at Wetumpka, Alabama.



Kretschmer M'fg Company,
Box 60, Red Oak, Iowa.

BEE- SUPPLIES!

Best-equipped factory in the West; carry a large stock and greatest variety of every thing needed in the apary, assuring BEST goods at the LOWEST prices, and prompt shipment. We want every bee-keeper to have our FREE ILLUSTRATED CATALOG, and read description of Alternating Hives, Ferguson Supers. *Write at once for catalog.*

Agencies.

Trester Supply Company, Lincoln, Neb.
Shugart & Ouren, Council Bluffs, Iowa,
Foster Lumber Company, Lamar, Colo.



BINGHAM SMOKER.

Dear Sir:—Inclosed find \$1.75. Please send me brass smoke-engine. I have one already. It is the best smoker I ever used.

Truly yours,
HENRY SCHMIDT, Hutto, Tex.

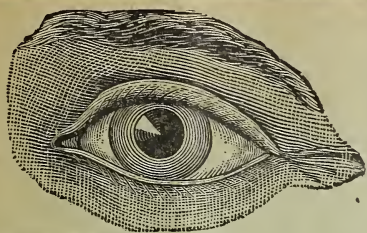
MADE TO ORDER

Bingham Brass Smokers.

Made of sheet brass, which does not rust or burn out; should last a lifetime. You need one, but they cost 25 cts. more than tin of the same size. The little open cut shows our brass hinge put on the three larger sizes. No wonder Bingham's four-inch smoke-engine goes without puffing, and does not drop inky drops. The perforated steel fire-grate has 381 holes to air the fuel and support the fire.

Heavy tin smoke-engine, 4-inch stove, per mail, \$1.50; 3¼-inch, \$1.10; 3-inch, \$1.00; 2½-inch, 90c; 2-inch, 65c. Bingham smokers are the originals, and have all the improvements, and have been the standard of excellence for 23 years. Only three larger ones brass.

T. F. Bingham, Farwell, Michigan.



BE WISE!

Place your orders early and save delays in freight transportation; also, avoid the worry and loss of not having supplies on hand when needed. We carry a full line of

A. I. Root Co.'s Goods,

can fill orders promptly at as low a price as well-made goods can be furnished.

Prices same as at Factory.

Send for our 40 page catalog.

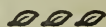
John Nebel & Son,
High Hill, Mo.

4 Per Cent. Discount for December Orders

Why Not



Place your order now? We will make you special prices for early delivery. We are headquarters in Central California for Root's Cowan Extractors, Sections, Weed Foundation, Smokers, etc., as well as a full line of local-made supplies. We can give you prompt service. We solicit your patronage.



Madary's Planingmill
Fresno, California.

Hagen's Foundation.

HAVING installed a complete, up-to-date Weed Process Comb Foundation Machinery, I am prepared to furnish a high grade of comb foundation, and am prepared to supply the same in regular packages. Work up wax, or take wax in exchange for foundation. I guarantee satisfaction.

Highest Price Allowed for Beeswax.

H. F. Hagen,
FACTORY
601 High Street.
Denver, Col.

Montana, Minnesota, Dakota, and West'n Wisconsin BEE-KEEPERS

Our 33d annual catalog (for 1903, 92d edition) is now ready. Send for a copy at once. We have a full line of goods in stock, and can fill orders promptly. Save freight by ordering of the St. Paul branch. **Bees and Queens.** Orders booked now for spring delivery. **Honey and Wax.** We handle honey and wax. Write for particulars.

The A. I. ROOT COMPANY
Northwestern Branch,
1026 Mississippi St.,
ST. PAUL, MINNESOTA
H. G. Acklin, Manager.

BEEKEEPERS *Notice*

We sell the Root goods here at Root's factory prices, which means the freight is paid to Des Moines, Iowa.

Immense stock and every variety of the best up-to-date goods now on hand packed for prompt shipment.

Satisfaction is guaranteed on every order sent us. Thousands have been pleased with their goods from us. We can satisfy you.

Write for estimates, sending list of what you will need, and for our discounts for early orders. We will save you money. Send to-day 1903 catalog.

JOS. NYSEWANDER,
710-12 W. Grand Ave.
DES MOINES, IOWA.

26th Year

Dadant's Foundation.

WHY DOES IT SELL SO WELL?—Because it has always given better satisfaction than any other. Because in 25 YEARS there have been no complaints, but thousands of compliments.

WE GUARANTEE SATISFACTION.—What more can anybody do? Beauty, purity, firmness, no sagging, no loss. PATENT WEED PROCESS OF SHEETING.

BEEWAX WANTED AT ALL TIMES.—Send name for our catalog, samples of foundation, and veil material. We sell the best veils, either cotton or silk.

LANGSTROTH ON THE HONEY-BEE, Revised. The classic in bee-literature. \$1.20 by mail.

Bee-Keepers Supplies
of All Kinds.

DADANT & SON,
Hamilton, Ill.

4 Per Cent. Discount DURING THE MONTH OF DECEMBER.

There is every evidence that there will be a heavy demand for goods the coming season; and if you defer placing your order until next February or March, you will not only lose your discount, but may have to wait for the filling of your order some weeks. Indeed, you can afford to borrow money, and get your goods now, thus having them all ready for next season's use.

Every Month You Wait, It Will Cost You 1 Percent Per Month.

The styles of goods will be about the same for next season, so there is no use waiting for a new catalog. But remember prices have advanced, owing to the increased price of material; but if you Take Advantage of our Early-Order Discount you will not be paying any more for your goods than last year.

A word to the wise is sufficient.

The A. I. Root Co., Medina, O.

BRANCH OFFICES:

CHICAGO, ILL., 144 E. Erie St.

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WASHINGTON, D. C., 1100 Maryland Ave., S. W.

SAN ANTONIO, TEXAS.

SYRACUSE, N. Y., 1635 W. Genesee St.

PHILADELPHIA, PA. 10 Vine St.

MECHANIC FALLS, MAINE.

Our Homes and Notes of Travel.

Alfalfa in Different Localities 412; Alfalfa on Michigan Soils 104; Aluminum v. Tin 811; Apiary, Somerford's 297; Apiary, Starting, in Cuba 501; Apiary, Woodward's 294; Automobile Factory, Olds 729; Automobiles 557; Automobile, Cost of Running 935; Automobiles v. Horses 731, 733; Automobile Trip in Michigan 560, 770; Automobling in Michigan 560, 643, 688, 770, 932.

Belmar Cave 455; Bees, Stingless, in Cuba 109; Bingham, T. F., Visit to 770; Boys, dealing with 504; Breakfast, None, in Cuba 163.

Cabin in the Woods 554, 972; Cappings, To Render into Wax 161; Cardenas, Cuba 454; Clover, Sweet, Future of 1020; Cold, Catching, Terry's Theory 508; Consumption, To Cure 1020; Cooking, Root's Short Cuts 555; Crown, Neglecting 969; Cuba, Our Own Apiary in 108, 161, 249; Cuba, Travels in 66; Cuba, Two Days in 251; Cuban Apiaries and Managers 294, 293, 453, 499; Cuban Homes 109; Cuban Mission Work 201, 252; Cuban Travels 111, 200.

Diet of Lean Meat 1019; Dollar for Looking ¼ Second 349; Doolittle Queens in Cuba 295; Drugstores and Liquor 1018; Gardening in Cuba 346; Ginseng, Its Cultivation 36; Grand Canyon 810; Greenhouse, ¼ Acre 505.

Healing, Divine 559; Hicks and Weather Bureau 599; Hives, Log, in Cuba 499; Hochstein's Apiary 250, 293, 401; Honey, Selling on Sunday 971, 1017,

Hottest Place in U. S. 812; Humbugs and Swindles 404.

Imagination Affecting Health 598.

Language, Spanish 68; Lettuce Under Glass 505; Lippia Nodiflora 936.

Maine as a Health Resort 349; Maple Sugar In Michigan 402.

Onion, Giant Gill raltar 164; Onions, Freaks of 349; Orange Nursery in Cuba 348.

Pansy-bed 554; Paso Real, Cuba 499; Pineapples in Cuba 250; Plum, Sloc 936; Potatoes, Wintering in Michigan 559.

Queens, Doolittle's 935.

Rambler's Apiary in Cuba 349; Rambler's Death 451; Rhubarb, Growing it in Winter 69; Shallots 412; Stealing Ideas 642; Strawberries in California 939; Strawberries, New Varieties 641; Strawberries, 500 from ½ Acre 506; Sugar-mills of Cuba 347; Suicide, Haste to Commit 453; Sunday on Saturday 1015.

Temperance in Cuba 162; Temperance Matters 20; Tobacco Column 509; Town with Saloons, Effect on Churches 772; Transportation Companies, Are they Soulless 639; Travels in California 933; Vetch, Sand 689, 813.

Waterworks of Havana 456; Weather Bureau 506; Whisky Advertisements 507; Whisky Business, Treating 507; White's Advertising Agency 933; Wilkin Sisters, Visit to 711.

Yumuri Valley 456.

WAX PROFITS.

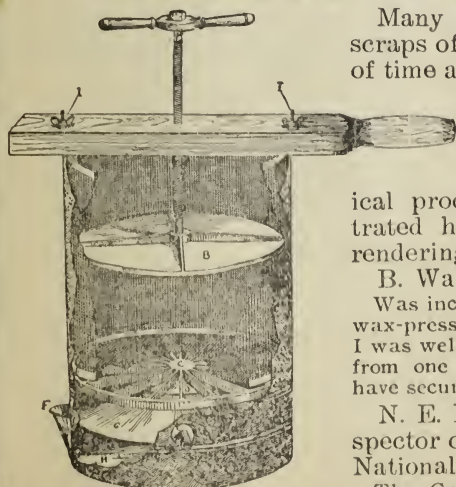


Fig. 169.—The Root-German Steam Wax-press. Price \$14.00. Shipping weight, 70 lbs.

Many bee-keepers allow old combs and scraps of beeswax to collect, which, for lack of time and the proper utensils, are scattered or eaten up by moth-worms. A big item would be added to the year's profits by the timely rendering of said wax by an economical process. We believe the press illustrated herewith fills a long-felt want in rendering wax.

B. Walker, Clyde, Ill., says:

Was inclined to believe at first that the German wax-press was a failure; but after a thorough trial I was well pleased. I secured 30 lbs. more wax from one day's use of the machine than I would have secured by the ordinary method of rendering.

N. E. France, Platteville, Wis., State Inspector of Apiaries, and General Manager National Bee-keepers' Association, says:

The German wax-press is by far the best machine or process to save wax from old black brood-combs.

Manufactured by

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- Green, W. J. 813; Greene, C. N. 627, 847; Greiner, F. 544, 595, 677, 720, 728, 759; Greiner, C. C. 188, 238, 287, 325, 339, 494, 593, 633, 769, 801, 963; Griffin, J. W. 153; Griffen, S. J. 637; Guernsey, A. H. 396; Guyton, J. W. 759.
- Haines, G. W. 537, 688, 1014; Hairston, J. T. 151; Hall, B. 627; Hall, B. C. 681; Hall, B. D. 813; Hall, F. W. 449; Hall, J. P. 626; Hall, L. E. 62; Halter, A. J. 724; Hahman, W. 441; Hamilton, C. R. 444; Hamilton, J. C. 592; Hambaugh, J. M. 333; Hamm, B. 1018; Hammersmark, J. T. 343; Hams, C. S. 150; Hand, J. E. 105; Hanson, G. M. 897; Hardy, A. A. 682; Hardy, R. A. 850; Harts, M. 626; Harrison, Mrs. L. 686; Harvey, F. H. 930; Hatch, C. A. 628; Hawley, G. M. 444, 967; Hayes, C. F. 153; Heard, J. 345; Heberly, J. A. 344; Heinkel, A. 553, 850; Hendrick, G. R. 149; Herrick, G. 1013; Hershiser, O. L. 383, 435, 491, 627; Hertzberg, O. F. 930; Higgins, H. A. 628, 848; Hilbert, J. 798; Hildreth & Segelken 428; Hill, M. H. 930; Hilton, G. E. 627; Hinkley, G. E. 1044; Hoaglin, 769; Hochstein, C. F. 294, 401, 679; Hochstein, L. B. 848; Hockett, Louis 68; Hoffa, W. I. F. 597; Hoffman, F. H. 596; Holle, R. C. 443, 780; Hollins, R. C. 392; Holtermann, R. F. 94, 189, 284, 388, 915; Horton, R. D. 728; Howe, G. B. 678; Howell, E. D. 450; Hubbard, G. K. 324; Humphrey, F. W. 844; Hunt, M. H. & Son 627; Hutchinson, W. Z. 67, 446, 835; Hyde, H. H. 14, 143, 338, 1014; Hyde, J. L. 685, 847; Inglass, C. S. 24; Issel, C. H. 65; Jackson, S. B. 594; Jacot, A. D. 550; Jameson, H. M. 553; Janes, W. M. 63, 635; Jaynes, H. E. 726; Jenkins, J. M. 246, 595; Johnson, J. E. 97, 343; Johnson, M. G. T. 292; Jones, H. B. 106; Jones, H. L. 727.
- Keating, P. 842; Kellogg, Dr. J. H. 963; Kennedy, B. 887; Kershaw, C. 724; Keyes, D. R. 246, 536, 596, 837; Kilgore, A. J. 154, 188, 395, 930, 1008; Kilian, E. H. 25; Kimball, J. 627; King, C. R. 928; Kintner, C. V. 240; Knight, A. 65; Knight, L. L. 682; Knoeger, F. W. 1010; Knolle, A. H. 154; Koehler, H. 679; Kretschmer, 628; Kuehne, M. R. 392, 679, 925, 1011; Kyle, J. G. 247.
- Lacey, F. 160; Lammey, J. 971; Lane, A. 63; Larrondo, J. E. 553; Lathrop, H. 147, 337, 1019; Lathrop, W. W. 593; Laws, W. H. 105; Leach, L. T. 884, 1011; Lee, A. G. 199, 584; Lehr, A. R. 157; Leitenberger, J. J. 768; Lemaster, P. G. 767; Leyvranz, A. 681; Lilian, E. H. 150; Lillev, Bogardus & Co. 628; Lindemuth, L. H. 636, 809; Little, W. 253; Littlejohn, W. H. 805; Lockhart, F. A. 103, 324; Long, I. 929; Lyte, J. W. 628; Lytte, J. R. 156.
- Macdonald, J. A. 155; Mack, J. M. 767; Marlow, A. E. 929; Marshall, M. 684; Marshall, W. G. 1010; Martin, A. L. 344; Martin, J. H. 288; Mason, J. 626; Mason, J. B. 627; Massie, T. K. 496, 545, 561; Matteson, I. C. 726; May, C. H. 559; McAdams Seed Co. 627; McCook, J. 695; McCarroll, 842; McEvoy, W. 55, 288, 344; McGlade, F. 627; McGregor, A. 243; McKay & Stroud 626; McKeon, J. 682, 767; McKellip, W. A. 335; McLean, D. A. 139, 588; McManus, T. 442; McKicker, G. 445; Messer, J. J. 626; Merritt, F. M. 626; Middleton, Geo. R. 149; Miller, A. C. 238, 340, 493, 534, 632; Miller, C. 685; Miller, Dr. C. C. 243, 632, 626, 804, 856, 964, 1008; Miller, F. J. 631; Miller, S. E. 627, 715; Miller, S. F. 157; Millie, C. R. 247; Minchin, S. 164; Minnick, J. A. 848; Mohler, G. H. 569; Moore, H. F. 95, 956; Moore, J. P. 398, 667; Morgan, F. W. 246, 853; Morrill, F. L. 962; Morrison, W. K. 96, 141, 233, 336, 629, 671, 799, 838; Morse, J. E. 69; Moyer, E. 887; Moyer, M. 237; Muckle, R. 292; Murphey, M. W. 288; Murray, E. C. 753; Murray, J.-W. 391; Murray, R. V. 393, 450; Muth, Fred W. 149.
- Naftee, W. C. 680; Nance, J. L. 849; Nebel, J. & Son 628; Newell, W. 241, 675, 680; Newman, M. L. 674; Nichols, M. D. 393; Norton, C. E. 805.
- O'Brian, Mrs. J. 345; Oliver, I. D. 150; O. L. W. 447; Osburn, H. G. 670.
- Pace, H. M. 592; Page & Lyon Mfg. Co. 628; Parker, C. L. 876; Parker, C. F. 886; Parker, G. D. 682; Parman, L. W. 160; Patrick, W. H. 637; Patton, J. S. 551; Peak, S. A. 591; Pease, G. E. 849; Peck, S. A. 848; Peterson, R. 809; Pettit, S. T. 331, 548; Pettengell, C. H. 450; Phillips, E. F. 761, 839; Phillips, G. W. 490, 539, 919, 958; Phillips, H. B. 198; Phillips, M. H. 624; Pickard, W. J. 445; Pickup, E. 626; Pierce, C. H. 160, 498; Piper, H. 535; Place, G. H. 159; Polley, R. F. 188; Pouder, W. S. 626; Portland Seed Co. 666; Pridden, W. A. 231, 283; Proven, R. 592; Prillaman, J. H. 292; Prother & Arnold 627; Pulsier, C. F. 688.
- Quiren, H. G. 145, 498, 553, 968.
- Rauchfuss, G. 93, 625; Rawlins, T. F. 394; Rector, W. E. 549; Reed, J. M. 188; Reetz, W. 806; Reno, J. T. 926; Reynolds, J. H. 728; Rhoads, M. P. 160; Rice, R. B. 626; Rice, W. G. 628; Riddell, J. B. 926; Rohrig, W. 625; Root, A. I. 380, 588; Root, E. R. 59, 99; Root, J. 445; Rose, D. E. 807; Ross, F. C. 807; Rousseau, L. C. 551; Rozelle, G. E. 594; Russell, H. H. 29.
- Saffell & Kerrick 628; Salisbury, F. A. 439, 627, 686; Sanders, H. E. 188; Savage, C. P. 804; Schaeffe, E. H. 152; Schneider, J. 97; Schrock, H. J. 1012; Schwarz, J. J. 595; Schwartzburg, E. H. 683; Scott, W. H. 151; Sears, H. C. 924; Secor, E. 52; Selck, W. W. 628, 769; Selser, W. A. 627; Shackelford, J. T. 807; Shearman, J. O. 800; Shepard, M. W. 841; Shirer, G. R. 150; Short, M. L. 637; Simmons, C. L. 681; Simpson, W. 768; Slayton, D. 341; Smith, A. W. 627; Smith, Mrs. E. E. 887; Smith, G. H. 635; Smith, J. A. 727; Smith, K. 929; Smith, W. P. 244; Smithkone, H. W. 148; Sniffen, C. L. 638; Snodgrass, R. L. 929; Snyder Penn Co. 144; Somerford, F. N. 918; Somerford, W. W. 397; Sparhawk, N. A. 246; Stachelhausen, L. 54, 636, 714; Stafford, H. F. 844; Stebbins, Mrs. C. A. 447; Stewart, C. 106, 326, 441; Stewart, E. L. 497; Stewart, W. L. 160; Stinson, E. 10, 15; Strangways, G. W. 387, 675, 808, 928, 929; Strauli, A. 636; Suhre, H. W. 805; Swarthmore 19, 56, 147, 485; Swartz, R. H. 153; Swinson, A. L. 392.
- Tackaberry, A. B. 968; Talbot, F. 345; Tate, J. 626; Taylor, R. L. 769; Taynton, R. W. 157; Terry, T. B. 569; Thomas, D. B. 103, 58, 882; Thompson, B. J. 627; Thompson, J. H. 98; Thompson, J. W. 390; Thwing, C. B. 235, 345; Tinsley, C. R. 1009; Tracy, W. J. 861; Tribbett, W. E. 242.
- Ueck, Wm. 24; Union Hive & Box Co. 625; Utt, L. J. 597.
- Vassmer, H. O. 595, 804; Van de Mark, F. W. 765; Veith, A. 155, 498; Vickery, W. 626.
- Wager, D. I. 158; Walsh, J. 292; Warner, A. D. 551, 637; Washburn, F. L. 961; Watts, A. C. 761, 861; Wanford, D. 684; Weaver, A. 448; Weaver, V. 722; Webber, E. 597; Weber, C. H. W. 151, 228, 628; Webster, E. S. 247, 332, 445; Weingart, G. W. 25; Wessing Bros. 625; Weston, E. B. 153; Weston, G. B. 809; Wheeler, E. C. 626; Whitaker, E. H. 626; Whiting, J. I. 768; Whitney, W. 848; Whitney, W. M. 437; Wickson, E. J. 394; Wilber, V. 732; Wilcox, F. 849; Wiley, H. W. 53, 63, 532, 842; Williams, J. E. 626; Wilson, C. W. 244; Wilson, H. 597; Wilson, J. W. 448; Wilson, R. A. 638; Wimmer, Jacob 107; Wing, B. M. 25; Wise, J. S. 248; Wisterman, R. T. 398; Wolfe, A. D. 971; Woods, D. L. 926; Wood, D. 64; Woodman, L. C. and A. G. 628; Woodward, C. E. 25, 295, 296, 395, 401, 592, 638, 927; Woodward, E. N. 484; Wright, A. J. 543.
- Yates, C. 253; Yoder, G. J. 103; York, G. W. 626; Yost, C. A. 243; Young, A. P. 25, 247, 398; Young, J. G. 638; Young, N. 634.
- Zahler, E. F. 718; Zimmerman, J. 1010.

Candied, in Paper 196, 197; Honey, 20 Tons Piled up 1051, 1052; Honey-stand, Phillips' 198; Honey-storage House, Mercer's 964; Hooper's Apiaries 539, 540.

Incubator, Stanley's 446; Introducing-cage, Kintner's 240.

Jamaican Bee-Keeping, Illustrated 487-490; 539-543.

Keyes' Bee-brush 596; Kintner's Introducing-cage 240.

Lewis, G. B. 846; Logwood Branch and Blossoms 485; Logwood-tree 457.

Martin Cartooned 99, 103; Martin, John H. 99; McManus Rabbit-spaced Frames 442; Mercer's Honey-storage House 964; Miller's Paper-covered Cover 632; Moore's Export Queen-cage 667; Moving Bees at Medina 495; Moving Bees, Entrance-closing Device 675; Murray's Wheelbarrow 391.

Nebel, J. 482; Nebraska Honey flora 59-62; Newman, Thos. G. 280; Nuclei, Swarthmore's 19, 20, 21; Numbering-tags 445.

Observatory Hive, Large 961.

Palm, Royal, in Cuba 502; Paso Real 500; Phillips' Truant Swarm 920, 921; Phillips, E. F. 764; Pickled Brood 377; Piper's Swarm-catcher 535; Poison from Bee-stings 668; Pridgen's Queen-rearing Hive 231, 232.

Queen Eggs, Development of 839, 840; Queen-cells a la Stanley 883; Queen-cells Reared at Medina 725; Queen-clipping Illustrated 429; Queen-fertilizing Box 537; Queen-mating Boxes 19, 20, 21; Queen-rearing a la Stanley 806; Queen-rearing Hive, Pridgen's 231, 232.

Rambler Cartooned 99-103; Rambler's Apiary in Cuba 499; Rambler's Cuban Apiary 400; Rambler's Portrait 99; Rambler's Slate 400; Rat-trap, Murray's 393; Reno, Nevada 1054; Residence and Apiary of Van de Mark 766; Reversible Extractor, Double Pocket 879; Root Co.'s Apiary in Cuba 501; Root, A. L., in Cuba 500, 501; Root, A. L., and Huber in Automobile 724.

Salisbury's Wax Press 440-442; Sampson's Hive

248; Scraper, Swarthmore's 147; Scraping-boxes Swarthmore 147; Scraping-tool, Mack's 767; Section former and Foundation-fastener 697; Section-holder, to Nail 445; Section-press, Handy 443; Sections, Prize 492; Shed Apiary 719-722; Shed, Bee, Alexander's 719, 720; Smoker, Automatic Clockwork 1001; Smoker, Brodbeck's 434; Smoker, Breech-loading 886; Smoker, To Hold 432; Smoker, Vesuvius Improved 594; Smoker-hinge, Getaz' 879; Smoker-hook 432; Solar Extractor, Lamp-heated 594; Spanish Senoritas 502; Stakes for Hive-stand 392; Stanley Cages 806; Stanley Queen-cells and Stanley Gunwads 883; Stanley's Queen-incubator 446; Staples for Fastening Hive-covers 430; Stevenson, Waldo, and Family 252; Stings, Bee, and their Effect 668; Swarm-catcher, Piper's 535; Swarm, Hiving 669; Swarm, Truant 920, 921; Swarm, Mammoth 803; Swarms, Runaway, Brought Home on Bicycle 723; Swarthmore's Bee-catching Box 57; Swarthmore's Mating-boxes 19; Swarthmore's Queen-house 486; Swarthmore's Scraper 147; Sweet Clover on Coal-mine Dumps 765.

Tacks, Double-pointed, for Fastening Covers 430; Tenement Wintering-case 239; Thwing's Method of Wiring 236; Thomas' Winter-case 882; Tool, Hive-scraping 767.

Uncapping-device, Hochstein's 629, 848; Uncapping Nail-spaced Frame 765.

Vesuvius Smoker Improved 594; Von Siebold 763.

Watermelons in California 955; Watson's Dairy Barn 22; Watson's Ranch 22; Wax-press, Salisbury's 440; Wax-press, Spring 496; Wheelbarrow Springs 1012; Wheelbarrow, Murray's 391; Whitcomb, E. W. 59, 60; Wild Cucumber at Gandy's 61; Winter-case, Strawboard 882; Wire-cutter for Foundation 395; Wiring, Carr's Method 449; Wire Frames, Greiner's Method 677; Wiring Frames, Greiner on 501; Wiring, Young's Method 247; Women, Bee-keeping for 669.

Young's Method of Wiring 247.

Contributors.

Aarons, C. M. 155; Achard, C. B. 188; Acklin, H. G. 428, 627; Adams, T. J. 546; Adams, N. 157; Ahlers, H. C. 248, 597; Aikins, R. C. 191, 286; Allen, Wilfred 65; Allen, J. H. 450; Alexander, I. S. 719; Alexander, L. 487; Alley, H. 158; Ames, F. 25, 341; Anderson, A. G. 448; Assam, H. 389; Astie, E. 443; Atkeley, E. J. 717; Atwater, E. F. 106, 149, 687; Austin, L. P. 349; Avant, L. W. 930; Averill, B. F. 764; Avon, B. 450; Axtell, Mrs. L. C. 384. Bachler, J. 966, 1012; Baldwin, J. W. 199; Barnell, J. 290; Barnhart, C. L. R. 966; Bassett, Nellie G. 61; Bates, G. A. 334, 398; Baier, J. G. 635, 847; Beauchamp, J. W. 1069; Bechly, F. 676; Beck, B. 1003; Bell, L. R. 18; Bellamy, J. R. 813; Bellangee, J. L. 595; Bender, C. F. 289, 626; Benoit, F. 552, 682; Benton, F. 65, 327, 532, 684, 725, 768, 842; Bergh, L. J. 804; Bixby, J. L. 481; Blackman, J. & Son 626; Blaisdell, W. S. 927; Blake, C. 199; Blake, C. S. 230; Blake, E. L. 63, 150; Blakely, T. 159; Blayne, H. G. 569; Blunk, J. P. 626; Boardman, H. R. 875; Booton, H. 930; Bostwick, G. A. 596; Bowen, J. 846, 883; Bowling, W. 628; Bramel, G. W. 450; Bray, L. 1012; Brewer, M. S. 626; Brockunier, W. W. 159; Brodbeck, G. W. 382, 433, 625; Brown, F. E. 57, 497, 683; Brown, R. M. 1016; Bryant, S. G. 344; Buell, S. D. 450; Bulkley, Mrs. R. 552; Burke, J. J. 967; Burnett, R. A. 590, 683; Burns, J. H. 767, 849, 885. Callbreath, J. S. 631; Campbell, S. M. 634; Canoles, G. W. 681; Carr, H. M. 449; Carson, W. S. 188; Carter, C. K. 151, 245, 393; Cary, W. T. 459, 482; Cary, W. W., & Son 688; Casselman, J. 152; Chambers, D. 592; Chambers, J. E. 597, 939; Cham- a Evaporator Co. 403; Chantry, T. 449; Chapin, S. 394; Charron, A. M. 345; Chenoweth, J. I. 58; Chesterman, Mrs. A. E. 595; Churchill, E. G. 397; Clapp, N. A. 404; Clare, F. P. 380; Clarke, A. A. 394; Clarke, F. H. 927; Clarke, L. H. 1009;

Claxton, L. 687; Clemans, A. 288; Clifton, F. J. B. 619; Clover, K. 537; Coggs, W. L. 485, 758; Cogswell, F. H. 626; Conan, B. 290; Conklin, E. G. 451; Cook, A. J. 199, 287; Cook, F. P. 725; Cooley, S. 929; Cormac, J. 626; Coursey, J. A. 628; Craig, J. M. 332; Crane, J. A. 432; Crane, J. E. 627; Crawford, R. J. 344; Crowder, J. F. 1005; Crowell, C. A. Jr. 398; Crum, G. B. 595; Crust, W. R. 727; Culum, G. 627; Culvey, J. W. 844. Dadant & Son 626; Danzenbaker, F. 99, 157, 628; Darby, J. J. 1014; Davis, J. M. 549; Davidson, E. M. 234; Davison, W. T. 725; Denman, G. H. 627; Dewitt, L. A. 847; Diamond, J. F. 107; Dibble, H. D. 188; Dickson, C. G. 62; Dierker, J. H. page 627; Doan, S. 152; Doolittle, G. M. 15, 637, 712; Doud, A. V. 869, 849; Dubois, E. 152; Dubois, E. G. C. 248; Du Bois, F. 156; Duley, G. W. 343. Eagerty, W. H. 1012; Eastwood, W. O. 158, 922, 1011; Eddy, F. L. 638; Ellenberger, G. M. 928; Ellsworth, R. H. 292; Elwood, P. H. 143, 688; Emerson, G. L. 382; Ercanbrack, C. K. 550. Farrington, S. 626; Fajio, A. E., V. B. 236; Fay, J. W. 146; Ferry, H. S. 64, 158; Finstad, J. 152; Fitz, Hart H. 842, 884; Fitzgerald, J. 552; Fixter, J. 546; Flanary, C. H. 725; Fleming, A. D. 11; Fouch, F. R. 155, 767; Fox, E. 596, 728, 764, 856, 1013; France, N. E. 627; Francis, E. N. 768; Frank, J. C. 188; Freeman, S. 404, 597; Frost, C. W. 668; Fuge, C. S. 807; Fuller, O. C. 683, 769. Gandy, J. L. 627; Gallimore, Rev. C. 907; Gates, C. E. 1013; Gathrigat, W. C. 552; Gehrels, W. B. 285, 859; Getaz, A. 547, 879; Gibbs, J. M. 289, 760, 880; Gill, M. A. 355; Gilliland, W. J. 342, 887, 956; Gilstrap, W. A. H. 331, 343, 550, 846; Golden, J. A. 808; Goodwin, G. E. 627; Grantham, B. 152; Gray, J. W. C. 847; Green, J. A. 138;

Heads of Grain Department 279; Health Talks 136; Heddon on Commercial Organization 188; Heddon Patent Expired 187; Hetherington on Forced Swarming 136; Hive Lumber, Cost of 1004; Hive, Size of 957; Hives, Arrangement of in Bee-yard 533; Hives, Cost of Making 1000; Hives, Home-made, v. Factory 1003, 1004; Hive-stands, Dual 877; Honey Business, Profits of 325; Honey Crop for 1903 584, 625; Honey in Paper Bags 1001; Honey Keeping Liquid 1044; Honey Situation in California 583; Honey, Candying, Philosophy of 326; Honey, Cuban, in America 667; Honey, Kellogg on 955; Honey, Prices too Low 429; Honey, Pure, Defines 13; Honey, Ripe and Unripe 957; Hyde Married 533.

Insurance on Bees 755; Introducing, Massie's Method of 376; Irrigation in Alkali Lands 585.

Kellogg on Honey 955; Kodaking at Medina 668. Langstroth and Quinby 1002; Los Angeles Convention 624, 757, 1002; Lumber for Sections Scarce 428.

McEvoy for Director 956; McEvoy's Plan to Stop Swarming 280; Miller's Book 189; Moore's Export Case 667.

National and General Manager 915; National Association, Troubles in 52; National Board of Directors 481; National Convention in Los Angeles 480; National Forging Ahead, 1045; National, Amendments for 624; National, Election for 92; National, Victory for 1005; Nebel, Death of 482; Newman, Death of 280; Newman, Illness of 187; Newell, Wilmon 583.

Ohio Convention 917, 956, 1000.

Paraffine for Snipping-cases 324; Parthenogenesis, Problems of 481; Pear-blight Problem 282; Pear-growing Situation, Bees Poisoned 376; Physical Culture 136; Pickled Brood, see Brood, Pickled; Poison-

ing During Fruit-bloom 531; Profits in Bee-keeping 1003; Profits in Supply Business 1003; Profits of the Bee Business 325; Pure-food Bill 11; Pure-food Bill, National 53, 93.

Queen-cell Work at Medina 712; Queen-rearing Illustrated 587; Queens, Clipping 428; Queens, Fertilizing in Small Boxes 712; Queens, Virgins, Introducing Two at Once 756, 797, 876; Queens, Why they do Not Lay 755; Questions, Answering 666; Questions and Answers, Value of 135.

Rambler Sick in Cuba 52; Rambler, Memoriam of 99; Rambler's Death Mourned 135; Rambler's Humor 187; Requeening, Time of 755; Review Editor at Medina 378; Review Office, Improvements at 186; Roofs of Hives 956; Roofs of Steel 956; Root Factory Prepared for Fire 915; Root, A. I., in Cuba 51.

Schaeffe, Death of 281; Sections, Four-piece 1005; Sections, Tall 379, 428; Sections, Unfinished, Selling 756; Self-spacing or Loose Frames 999; Smoker Fuel Partly Burned 755; Smoker Run by Clock-work 1000; Smoker-hooks 432; Smoker, Mode of Holding 432; Snows, Deep, and Clover 91; Spraying Crops, When 584; Staples for Fastening Bottom-boards 430; Supplies, Bee, Cost of 1004; Swarms Stopped with Blanket 325; Swarms in Tall Trees 711; Swarms, Removing from Tree 623; Swarms, Shaken 379; Swarms, Stopping Two or More 280; Swarms, Stray, at Medina 711; Swarming, Forced 136, 669; Swarming, Furious, at Medina 623.

Testing Barrels for Leaks 325. Ventilation of Bee-cells 229; Virgins, Introducing Two at Once 756, 797, 876.

Waite, Dr., on Pear-blight 282; Watkins, S. L. 187, 324; Western Lands Reclaimed 585; Wiley Lie 1045; Wintering in Cellar in Medina 279; Wiring Foundation 999.

Illustrations.

Aikin's 10-pound Candied-honey Package 1008; Aikin's Paper-bag Honey-packages 196, 197; Alexander's Bee-shed 719, 720; Alexander's Extracting-room 490; Alfalfa, Unloading 1052; Alighting-board canvas 726; Anderson's Section-press 448; Apiary of Alexander 498; Apiary, Barnell's 291; Apiary, Mr. Carroll's 843; Apiary, Culvey's 844; Apiaries, Hooper's 539, 540; Apiary of Mr. Howe 678; Apiary of M. R. Kuehne 924, 925; Apiary of Rambler in Cuba 400; Apiary of Thorne and Ercanbrack 1051, 1053; Apiary of Van de Mark 766; Apiary, Webster's 332; Apiary in Sheds 719, 720, 722; Automatic Clockwork Smoker 1001; Automobile with two Roots 724.

Bag of Honey 196, 197; Barn, Large, in Nevada 1033; Bees Occupying Dwellings 923; Bees, Infuriated, Illustrated 966; Bees, Moving, at Medina 495; Bee-brush, Hemp 1013; Bee-brush, Keyes' 596; Bee-keeping for Women 669; Bee-moth, Fumigating, Greiner's Method 633; Bee-sifter, Greiner's 760; Bee-stings, Illustrated 668; Bennett, Miss Lodemia 480; Bicycle for Bringing Home Runaway Swarms 723; Bingham's Hive 801; Boomhower's Queen-mailing Case 797; Bottle-filling Device 287; Bottom-board, Danz Tilting 431; Bottom-board Feeder 884; Bottom-board, Tilting, Fitzgerald's 552; Brodbeck's Double-blast Smoker 434; Brood, Pickled 377; Brood-chamber, 20-frame 489; Buckbush at Gandy's 59, 60.

Cage, Boomhower's Queen-mailing 797; Cage, Moore's Export Queen 667; California Apiary, Typical 924, 925; Callbreath's Hive-stand 631, 632; Candied Honey in Bags 1008; Candied Honey in Paper 196, 197; Cans, To Empty 287; Canvas Alighting-board 726; Carter's Cell-preparing Tool 245; Catnip Plant at Gandy's 59; Cellar, Bee, Hilbert's 805, 806; Cells from Wooden Cell Cups at Medina 725; Cell-grafting at Medina 587; Cell-cups and cages, Stanley's 446; Cell-cup Tools, Carter's 245; Cell-protector Parts 842; Chicago Convention 105; Clark's Wire-cutter for Foundation 395; Clipping, Illustrated 429; Coal Mine Dumps 765; Cogshall's Frame 485; Colonies in Open Air 592, 593; Colonies in the

Siding of Buildings 923; Comb-building in Open Air 592, 593; Comb Honey's Barnell's 291; Convention, Chicago 105; Cornell Smoker, To Hold 432; Cover, Paper-covered 632; Cowan Jumbo Extractor 483; Crowder's Extracting-house on Wheels 1007; Cuban Apiaries, Glimpses of 499-501; Cuban Loggum Apiary 499; Cuban Shed Apiary 722; Cucumber, Wild 61; Cupid's Tricks 753.

Dairy Barn, Watson's 22; Daisy Foundation-fastener, Improved 687; Danzenbaker Prize Sections 492; Danzenbaker's Tilting Bottom-board 431; Danz Hive-stand 885.

Egg, Development of 839, 840; Entrance-closing for Moving 675; Extractor, Double-pocket 879; Extractor, Power-driven 483; Extracting-house, Portable 591; Extracting-house on Wheels 1007; Extracting-room, Alexander's 490.

Feeder and Cover Combined 64; Feeder in Bottom-board 884; Feeder, Ferry's 64; Feeder, Koebler's 679; Fertilizing-box, Keyes' 537; Fertilizing-boxes, Swarthmore's 19; Formalin Apparatus 390; Formalin, Fumigating Device 538; Foundation-fastener and Section-former 687; Foundation-fastener, Young's 634; Foundation-wire Cutter 395; Fowl's Portable Extracting-house 591; Frame, Cogshall's 485; Frames, Hoffman's to Nail 235; Frame, Nail-spaced, for Uncapping 765; Frames Spaced in Hive-rabbits 442; Frames Wired on Thwing's 236.

Grafting Cells at Medina 587; Grand Canyon of Arizona 846; Greiner's Bottle-filling Device 287; Greiner on Wiring Frames 801; Greiner's Bee-sifter 760; Greiner's Fumigating-room 633; Greiner's Lamp-heated Solar Extractor 594; Greiner's Tentement Wintering-case 239.

Heartcase in Nebraska 62; Hive, Bingham's 801; Hive, Large Observatory 961; Hive, Sampson's 248; Hives of Brick 141; Hives, Atwater's 141; Hive-fasteners, Staple 430; Hive-number Tags 445; Hive-stand, Callbreath's 631, 632; Hive-stand, Danz 885; Hive-stand, Root's 886; Hive-stand of Stakes 392; Hochstein's Uncapping-device 629; Hoffman's Frames to Nail 235; Honey in Bags 1008; Honey,

Forced, Stachelhausen on 54; Swarms, Forced, Elwood on 143; Swarms, Forced, Langstroth on 547; Swarms, Forced, for Extracting 156; Swarms, Forced 54, 151, 153, 708, 751, 959; Swarms, Forced, Ahead 290; Swarms, Forced, a Failure 841; Swarms, Forced, Unsuccessful 966; Swarms, Forced, a Modification 792; Swarms, Forced 233; Swarms, Forced, Swarming 995; Swarms, Jounced, etc. 286; Swarms, Mixed, McEvoy's 546; Swarms, Removing from Trees 879; Swarms, Returned, Swarming again 87; Swarms, Sifted 546; Swarms, Stopping with Smoke 619; Swarms, To Prevent Mixing 288; Swarms, To Prevent Mixing 535; Swarming 186, 530; Swarming Announced by Parrots 443; Swarming, Dadant's 871; Swarming, Forced 247, 248; Swarming, Forced, Fighting 199; Swarming, Prevention of 54, 380, 629, 758, 849; Swarming, Unusual 633; Swarming, Early 157; Swarms, Non, Strain of 967, 1009; Swarthmore's Small Mating-boxes 19; Syrup, Feeding 849; Syrup To Make 809.

Tarred Paper Objectionable 681; Tarred Paper for Winter 534; Tenement Hives 238; Texas Pseudo Science 241; Thieves Caught in California 873; Thieves France Catches 529; Thistle Blue 595; Thomas' Winter Case 882; Tying Up v. Under 491, 493, 528, 580, 620, 663; Tying Up Rather than Under 333; Tying Over or Under 839; Tool, Burr-comb 767; Tool, Hive 791; Transferring 804; Transferring by Short Method 591; Transferred Combs to Hold in Frame 156; Transferring from Box Hives 345; Trees, Rapid-growing 63.

Umbilical Cord in Bees 8, 241, 276; Uncapping-device, Hochstein 848; Uncapping-knife, Hochstein's 629; Unfinished Sections, see Sections; United States as Seen by Spanish 997; Uniting 754; Unit-

ing in the Spring 226; Unqueening in Spring 791.

Venezuela for Bees 799; Ventilation of Cellars 15; Ventilation in Summer 883; Ventilating Hive 184; Virgins, Introducing Two, see Introducing, Watermelons in California 964; Water, Distilled 791; Watkins again 444; Watson's Ranch, Nebraska 21; Wax Indigestible 65; Wax on Offending Objects 638; Wax and Honey Production 336; Wax Production 918; Wax Production Profitable 336; Wax from Sugar 709; Wax in Tropics 336; Wax, How Much to Squeeze 132; Wax, Preparing for Foundation-mill 681; Wax, Rendering in Boiler 439; Wax, to Separate from Propolis 150; Wax-press as Honey-squeezer 872; Wax-press, Cheap 439; Wax-press from Cider-press 597; Wax-press, German 1011; Wax-presses Run by Water or Steam 132; Wax-press, Spring for 496; Wax-press, Squeezing Honey in 336; Weed Foundation 284; West Indies, Notes from 154; Wheelbarrows 1012; Wheelbarrows, Improvement in 391; Wiley on the Purity of Honey 63; Winter Case of Strawboard 882; Winter Hives, to Pack 24; Winter Losses 133; Winter Packing v. No Packing 371; Winter Repositories, see Cellars; Winter Stores 724; Winter, Preparing for 993; Wintering in Tenement Hives 238; Wintering in Tenements 967; Wintering Two Bunches of Bees 183; Wintering Indoors or Out 157; Wintering with Supers 926; Wintering, Mortality of Bees 63; Winter-case of Tarred Paper 534; Winter-passages in Combs 998; Wiring, see Frames; Wooden cell-cups, Why Better 931; Worker Comb, To Get 467; Wrists, Bare 620; Yellow-jackets 1010; Yellow-jackets, Killing 152, Zinc, Perforated, Which Side Up 397.

Editorial.

Acklin, Ethel, Recovered 281; Aikin's Paper Bag for Honey 1001, 1045; Alkali Lands Reclaimed 585; Alfalfa, Cutting Before Blooming 93; Alfalfa, Cutting it Before or After Blooming 12; Alfalfa, Food Value of 12; Alfalfa Honey, Quality of 375; Alfalfa-growers, see Bee-men; Alpaugh to Cuba 51; Amendments, Proposed, for the National 624; American Bee-keeper 324; Ants Spreading Foul brood 11; Apiaries, Arrangement of Hives 533; Apicultural Support at Ottawa 956; Appropriation for Beekeepers 136; Arizona, Plants of 1046; Association, National, see National; Austria, Drouth in 91; Automobile Trip, A. I. R.'s 710; Automobile Trip of Editor's 51; Automobile, Editor's 378; Automobiling, Pleasures and Penalties 529.

Barber, Ira, on Wintering in Cellars 229; Barrels and Cans, Leaky 325; Basswood, Scarcity of 428, 713; Bee Editors, Qualifications, for 1005; Bees and Spraying 584; Bees Dangerous 916; Bees and Fruit 957; Bees and Pear-blight 282; Bees Necessary to the Fruit-grower 13; Bees Poisoned 376; Bees to Cuba, Root's Shipment 51; Bees, Five-banders, for Comb Honey 623; Bees, Minus Abdomen 531; Bees, Moving to Our Outyards 481; Bees, Moving Short Distance 1045; Bees, Red, from Colored Syrup 379; Bee-brush, To Make 755; Bee-brush, Handiest 533; Bee-cellars, Ventilation of 229; Bee-gloves 585; Bee-journals, Subject-matter of 135, 187; Bee-keeping for Women 668; Bee-stings, Easing Pain of 755; Bee-stings that are Painful 585; Bee-men v. Alfalfa-growers 917; Bee-suit 916, 957, 1005; Bee-cellar Under Machine-shop 279; Beef Diet 136; Bennett, Dema, Death of 479; Bingham, T. F. 1002; Blight, see Pear-blight; Boardman Feeder Improved 483; Bottom-board, Danzenbaker's New 431; Bottom-boards and Covers, Fastening 430; Brood-chambers, Shallow 227; Brood, Pickled 377; Butterflies v. Bees as Blighting Agency 11.

Cages for Export 667; California's Good Year 376; California, Rains in 227; Candying of Honey, Philosophy of 326; Candied Honey in Paper Bags 711; Candied Honey, Paper Boxes for 1001; Candied Honey, Problems of 1045; Cans and Barrels, Testing

325; Carpet Grass 228, 324; Cellar Wintering, see Bee-cellars; Cell Cups, Swarthmore's 755; Cells, To Graft 587; Chicago Convention 956; Cincinnati Convention, see Ohio Convention; Clover for Bees 957; Clover, Sweet, Canard about 666; Clover, White, in Wisconsin 666; Clover, Red, Affected by Weather 756; Cogshall on Closing Entrances 429; Colony that would not Swarm 669; Colorado Anti-adulteration Law 427; Comb Honey, Manufactured; Comb-mills, Inventor of 1002; Commission Men, Untried 877; Co-operation and the Policy of Gleanings 378; Cost, Counting the 1000; Covers 1044; Covers and Bottom-boards, Fastening 430; Cuba, Climate of 135; Cuba, Hilbert on 376; Cuban Honey in American Markets 667; Cuban Shipment of Bees 51.

Danzenbaker at Medina 711.

Entrances, Closing in Cold Weather 429; Entrances, Contracting in the Fall 755; Exercise, Scientific 136; Extractors, Jumbo, Run by Power 483; Extractors, Power 92; Extracting-houses, Portable 583.

Fertilizing Queens in Small Boxes 712; Food Value of Honey 955; Food, Pure, see Pure Food; Forced Swarming, see Swarming; Forced; Forest Fires and Lumber Question 714; Formaldehyde, see Formalin; Formalin, Adulterated 955; Formalin Tried by Weber 877; Formalin Treatment Not Thorough 915; Formalin for Foul Brood 326; Forty Years Among the Bees 189, 229; Foul and Black Brood, Identity of 586; Foul Brood Disappearing in Ontario 280; Foul Brood v. Pickled Brood 377; Foul Brood in the Human Mouth 324; Foul-brood Bill for Ohio 917, 956, 1000; Foul-brood Bills in Various Legislatures 228; Frames Supported on Nails 1044; Fowls' Extracting-house 583; Fowls Visited by the Editor 379; France, General Manager 189; Frames, Self-spacing or Loose 999; France a Busy Man 533; France a Good Manager 431.

Gallup, Death of 376; Gasoline Engine for Extracting 92; Gleanings, Contents of 135, 187, 227, 279.

Hayes, Oakie, Refusing to Pay for Queen 376;

335; Honey, Increasing Demand for 437; Honey, Iron in 9; Honey, Keeping from Canding 968, 1044; Honey, Keeping it Liquid 831, 996; Honey, Labeling 925; Honey, Name on 321; Honey, Specific Gravity 189; Honey, Planting for 278; Honey, Poisonous 682; Honey, Price of 752; Honey, Pure, Wiley on 63; Honey, Raw 423; Honey, Selling 930; Honey, Selling in Groceries 237; Honey, Serving at Table 373; Honey, Soured 926, 967; Honey, Stung 931; Honey, Testing 224; Honey, Uncapped, Experiments with 189; Honey, Unripe 590, 683; Honey-bottles, To let 287; Honey-dew as Winter Feed 869; Honey, Nives, Use of 996; Honey-packages of Paper, see Honey; House, Extracting on Wheels 1005; Hutchinson's Pictures 832.

Idaho, Bees in 140; Idaho, Echoes from 103; Increase 374; Insurance on Bees 688; Introducing Two Virgins at Once 792, 884, 927; Introducing, Brood-frame 240; Introducing, Doolittle on 49; Introducing, Kink in 289; Increase, Quickest Method 199; Incubators or Nurseries 751; Ireland as a Honey Country 953; Italian Bands Yellow 638; Italians, Golden 759; Italians v. Robber-traps 25; Italians Not in Sections 914; Italianize, When to 152.

Jenkins' Postoffice 246; Journals, Foreign List of 185, 225, 277.

Kellogg on Honey 963; King Birds 929.

Labels, Paste for 248; Langstroth on Forced Swarms 547; Larva for Queen-rearing 619; Law, Foul-brood Illinois 475; Law, California Foul-brood 333; Laying Worker, see Fertile Worker, Literature, Bee, Introducing 49; Laying, To Cure 931; Locality 912; Locality, Difference in 707; Locality, Importance of Knowing 995; Logwood-tree of Jamaica 487; Los Angeles, Cal. 994; Los Angeles Convention 663; Los Angeles, Weather in 971; Lumber Scarce 752.

Mail Privileges 48; Market, Chicago 996; Massie's Hive and Book 545; Mating-boxes, see Queen-mating Boxes; McEvoy as Arbitrator 344; McEvoy on Swarms Mixing 288; McEvoy on Swarms Mixing 397; Meal, Feeding 345; Mercer's Honey Crop 964; Michigan Convention 380; Michigan, Northern 380; Michigan, Northern, for Honey 447; Miller's Honey Flow 832, 872; Miller's Honey Season 751; Moles in Apiary 9; Mosquito-hawks 844, 1010; Moth, Killing 285; Moth-balls in Hives 793; Moth-worms 665; Motherwort 223; Mouse, Dead, in Hive 807; Moving Bees, see Bees; Moving to Better Location 292; Moving Bees Short Distances 551.

National Treasury 223; National Constitution 372; National, Changes in 224, 277; National, Membership of 911; Nightingales and Bees 9; Nomenclature, New 286; Nomenclature of Bee Terms 152; Numbers, Hive 596; Nuclei, Forming Small 57; Nuclei, Small, for Fertilizing 536; Numbering-tags 474, 995.

Oklahoma Bee-keeping 765; Ontario Convention in New York 544; Orange-blossom Honey 98; Ordering Early 753; Organization, see Co-operation; Organization of Bee-keepers in California 57; Overstocking in Cuba 918.

Paper as Winter Protector 423; Paraffine Paper in Sections 395; Paralysis, Bee 25; Paralysis, Bee Sulphur for 160; Paralysis Cured with Salt 396; Paralysis, Rational Cure 438; Paralysis, Salt Cure 396, 450, 551, 595, 663; Parthenogenesis Explained 761; Pasturage, Artificial 637; Pear Blight 97, 288; Pear Blight, Remedy for 344; Pear Juice for Winter Feed 24; Pears from Seedlings Blighting 320; Peddling Bottled Honey 144; Phacelia 8, 47, 344, 527, 718; Phillips on Parthenogenesis 761; Pickled or Foul Brood 157; Poison from Spraying 808; Poison from Stings 792; Poison or Disease 591; Poison or What 635; Poisoning 675; Poisonous Fumes from Stings 444; Pollen in Brood-combs 90; Pollen in Sections 133; Pollen, How Bees Pack 727; Pollen, how Packed in Cells 340; Press, Salisbury's 686; Pridgen on Queen-rearing 231; Priority Rights 320; Propolis in Marengo 831; Propolis, Pronunciation of 913, 953.

Queen and Circle of Bees 595; Queen Dissected 839; Queen Leading a Swarm 88; Queen Preferring New or Old Comb 628; Queen Retinue 88; Queens of After-swarms 186; Queens Balled 844; Queens with Dented Sides 389; Queen's Egg, How Formed 839; Queens Fertilized in Carboy 94; Queens Kept from Laying 1012; Queens Stung in Ball 224,

276, 395, 592, 674, 708, 752, 927; Queens Stinging Persons 550; Queens Two Years Old 159; Queens in Uniting 290; Queens in Upper Story 687; Queen, Decoy 535; Queen, Clipped, in Ball 912, 951; Queen, Age at Fertilization 927; Queen, Breeder, Good 392; Queen, Dents in Side 498; Queen, How Long to Cage 685; Queen, Supersedure 636; Queen, Syrian 133; Queen, Why Balled 871; Queen Why Balled 930; Queens, Clipping 186; Queens, Clipping 384; Queens, Clipping 637; Queens, Introduction of, Quick 664; Queens, Int'g Two at Once, see Introducing; Queens, Late-reared 794; Queens, Longevity of 581; Queens, Marking 911; Queens, Nursery 48; Queens, Preference for New Comb 726; Queens, Pre-juaging 621; Queens, Replacing 581; Queens, Sterile and Supersede 398; Queens, Supersede of 581; Queens, Where to Buy 87; Queens, Where to Find after Hiving 64; Queens, Young Bees 597; Queenless, No Cells 596; Queen-cages, Miller 320; Queen-capping 476, 527, 675; Queen-fertilizing Boxes 19; Queen-rearing 9; Queen-mating, Wholesale 19; Queen-rearing, Alley's 958; Queen-rearing, Best Plans for 107; Queen-rearing, Doolittle on 478; Queen-rearing, Pridgen on 231; Queen-rearing, Pridgen on 283; Queen-rearing, Stanley's Plan 446; Queen-rearing in full Colonies 536; Queen-rearing in Summer 184; Queen-raising in Upper Stories 397; Queen-rearing, Science of 761; Queen-right 663; Queen-trap for Swarming 133; Questions and Answers 223, 289, 398.

Rambler 158; Rambler's Death 87; Rambler Memorial 99; Rambler's Pastor's Letter 244; Rambler, Unpublished Facts about 288; Raspberries for Honey 573; Rat and Mouse Trap 393; Red-clover Queens 728; Reproduction in Insect Life 761; Reputation, Building up 709; Robber Flies 725; Robbing, Bad Case 962; Robbing, To Prevent 381; Robbing, To Stop 320, 922; Robbing, and Gasoline-torch 962; Root Not a Candidate for Director 951.

Sage, White 792; Salisbury Wax-press 440; 475; Samson's Hive 248; Science, Pseudo 241; Scrapper, Swarthmore's 147; Scrapper, Handy 394; Sections 4x5 87; Sections Darkened by Brood-combs 619; Sections Whiter over New Combs 184; Sections by Weight or Piece 952; Sections by the Piece or Weight 995, 996; Sections of Cottonwood 680; Sections, Cost of 926; Sections, Cost of 952; Sections, Getting Bees in 914; Sections, Selling Unfinished 150; Sections, Taking off 664; Sections, To Get all Fancy 383; Sections, Well-filled 841, 849; Sections, Unfinished 850; Sections, Unfinished 928; Sections, Very Small 475; Section-press, Handy 448; Section-holders, To Nail up 445; Secor's Poem 50; Shaken Swarm, see Swarms, Forced; Shallow Hives, see Hives; Shedd's Apiaries 719, 721; Skunks 768, 769, 847, 930, 1013; Smoke at Entrance 912; Smoke, Use and Abuse of 880; Smoker Fuel 448, 751, 707, 758, 769; Smoker Fuel, Excelsior 681; Smokers 879; Smoker, Brodbeck's 433; Smoker, How to Hold 476, 751; Smoker, New Cornell 527; Smoker, Cornell, New Lid 832; Smoker, Jumbo 528; Smoker, Vesuvius 594; Smokers, Breech-loading 886; Smokers, Light 930 Smokers, To Handle 715, 963; Smoker-bellows with Tin Binding 476; Smoker-hook a Nuisance 475; Snake Imbedded in Propolis 1014; Snow at Entrances 153; Spray-pump in Apiary 680; Spring Dwindling 238; Stachelhausen on Brushed Swarms 54; Stamps, Rubber, Use Recommended 321; Stamps, Rubber 450; Stanley's Queen-rearing 446; Staples to Fasten Bottom-boards 475; Starters Preferable to Drone Comb 959; Starters, Use of 233; Stinging Queens, see Queens; Stings in Birds' Crops 727; Stings and Rheumatism 634; Stings, To Cure 597; Stings, Effect of 929; Stings, Neglecting 477; Stings, To Cure 848; Stings, Curing 767; Stings, Pain of 707; Stings, Poison from 792; Stinging v. Biting 638; Stings, Inhaling the Poison of 444; Stings, Rational Treatment of 588; Strainer, Rambler's 597; Sulphur for Bee Paralysis 160; Sun Extractor, Artificial Heat 593; Supers, To Take Off 931; Supers, Emptying of Bees 620; Supers, Shallow v. Full-depth 629; Supers, Taking Off 809; Supersede, To Detect 397; Swarms Mixing 552, 682, 847; Swarms Prevented from Mixing 397; Swarms Shaken Before Starting Cells 274; Swarms Watched by Dog 318; Swarm, Mammoth 803; Swarm, Truant 919; Swarms, After, Preventing 530; Swarms, Driven 543; Swarms,

ing 727; Colonies, Broodless 151; Colonies, Strength of, for Cell-building 145; Colonies, Strong v. Weak 374; Colonies, Weak, Killing off 292; Colonies, Weak 288; Colonies, Double-decker 678; Colonies, Characteristics of 880; Colonies, Enormous 528; Coloring in Bees 423; Comb Foundation, Value of 284; Comb Foundation, When to Give 292; Comb Honey in Shallow Brood-chambers 383; Comb Honey, Production of 954; Comb Honey, Production of 491; Comb Honey, Production of 435; Comb Honey, Production of 54; Comb Honey, Production of 394; Comb Honey, Bulk, see Bulk; Comb, Drone, When Built 385, 386, 387; Comb Old or New for Queens 105; Comb, New or Old 448; Comb, New v. Old 338; Comb Worker, To Get 426; Combs Melting Down 791; Combs to the Top-bars 235; Combs, Age of for Wintering 289; Combs, Empty, to Prevent Swarming 374; Combs, how Long to Use 90; Combs, Moldy, Gnawed 393; Combs, New or Old 550; Combs, Shallow, for Extracting 925; Combs, Surplus, Use for 387; Combs, Too Old 131; Combs, Old or New 131; Combs, Old v. New 156; Combs v. Foundation 553; Combs, Empty, To Keep 633; Congregational v. Presbyterian 88; Contraction 548; Co-operation 224, 382, 497, 619; Co-operation in California 57, 88; Co-operation in Ireland 49; Cover, Miller's 632; Covers, Sealed, Indorsed 105; Covers Discussed 1044; Cuba, A. I. Root in 87; Cuba, Bee-keeping in 234; Cuba, Early Bee-keeping in 670; Cuba and the Drink Question 184; Cuban Apiaries, by A. I. Root 499, 501; Cuban Bee-keepers, Prominent 397; Cuban Bee-keeping 918; Cuban Honey in America 758; Cuban Letters of A. I. R. 768; Cucumber, Wild at Dr. Gandy's 61; Culture, Physical 8, 47.

Daisy Improved 687; Danzenbaker Hive 146; Danzenbaker Hive for Comb Honey 397; Danzenbaker Hive for Swarms 63; Danzenbaker Hive for Winter 154; Danzenbaker Hive, Wintering in 682; Danzenbaker v. 8-frame L. Hive 243; Diet 872; Disease Fighting 926; Disease, New 422; Doolittle on Queen-rearing 478; Drone Comb 874; Drone Comb from Foundation 424, 841; Drone Comb from Starters 549; Drone Comb from Worker Foundation 1012; Drone Comb in Brood-chamber 708; Drone and Worker Comb 385, 386, 387; Drones for Heat 872, 880, 911; Drones Late in Season 795; Drones Killed off 848; Dysentery Not Caused by Confinement 106; Dysentery v. Confinement 247.

Editor of Gleanings Unbiased 425; Egg of Queen, How Formed 839; Elwood's Report 688; Entrances, Wide 678; Excluders, Which Side Up 397; Express Co.'s Selling Honey 242; Extracted Honey, Producing 714; Extracting Combs at one Side at Once 59; Extractors by Gasoline Power 334; Extractor, Mammoth, Steam 670; Extractors, Double Hinging 879; Extracting-house on Wheels 1005; Eyes of a Bee 84.

Feeder and Winter Cover 158; Feeder on Back of Hive 25; Feeder, Bottom-board 884; Feeder, Cheap 955; Feeder, Koebler's 679; Feeding back 497, 597, 621, 764, 841; Feeding Check Sugar 918; Feeding Outdoors 292, 385, 386, 387, 809; Feeding in Open Air 588; Feeding in the Spring 341; Feeding for Winter 754; Feeding Sugar-cane Juice 25; Fences in Brood-chamber 158; Fence for Brood-combs 289; Fertile Workers 371; Fertile Workers 320; Fertile Workers, Killing 533; Fertile Workers, Remedy for 155; Fertile-worker Colony 183; Fertilization in Carboy 388; Fertilization in Small cage 388; Fertilization in Confinement 94, 132, 388, 676, 912; Fertilizing-boxes, small 536; Fertilizing-boxes, see Queen-mating; Fertilizing-tent 184; Fertilizing-tent, Why it Failed 448; Filler, Paint, of Wax 529; Fire Loss, Bee-keepers 392; Five-banders, see Bees; Forced Swarms 936; Forests, Destroying 708; Formaldehyde, see Formalin; Formalin a Failure 968; Formalin in Food 708; Formalin 594, 595, 688, 911; Formalin discussed 1014; Formalin Patented 619; Formalin for Foul Brood 424; Formalin for Bee-moth 667; Formalin Gas for Killing Brood 151; Formalin, American 804; Formalin, Successful Use of 390, 441, 442; Formalin, Unsuccessful 926; Formalin, To Apply 390, 441, 537; Formalin, How Applied 372; Formalin, Use of 635; Formic Acid in Honey 846, 871; Food Value of Honey 903; Foul Brood 274; Foul or Pickled Brood

805; Foul Brood in Michigan 25; Foul Brood or Something Else 149, 769; Foul Brood and Frame Hives 665; Foul Brood, Canadian Report 55, Foul Brood, How Spread 527; Foul Brood, Odor of 830; Foul Brood, Perforations in 8; Foul-brood Law, California 333; Foul-brood legislation, California 333; Foul-brood Law in Idaho 106; Foul-brood Bill, Ohio 342; Foul-brood Bill, Pennsylvania 683; Foul-brood Bill, Illinois 276, 495; Foul-brood Scare 147; Foul Brood, To Cure 390; Foundation Drawn into Drone Comb 424; Foundation Sagging on Wires 922; Foundation Starters 675; Foundation Starters, Worker Comb on 426; Foundation, see Comb Foundation; Foundation, Dees Not Working 635; Foundation, Full Sheets, v. Starters 151, 385, 386, 387, 425, 547; Foundation, Keeping in Winter 345; Foundation, Weed 928; Foundation-cutter, Unique 395; Foundation-wire Cutter 395; Foundation-fastener, Young's 634; Foundation-fastener and Folder 687; Foundation-fastener, Daisy, Improved 687; Frames Spaced in Hives 442; Frame, Hoffman 764; Frames, Closed-end 146, 546, 800; Frames Closed-end, Size of 159; Frame, Hoffman, Condemned 485; Frames, Hoffman, Nailing 235; Frames, Hoffman, Pro and Con 320; Frames, Hoffman, Stuck up 243; Frames, Metal Spacers for 832; Frames, Propolized 792; Frames, Shallow, Profits in 276; Frames, Shallow, v. Deep 320; Frames, Spaces Rabbit. Not Practicable 442; Frames, Staple-spaced 274, 792; Frames, Spacing 708, 871; Frames, Spaced v. Unspaced 528; Frames, Wired 928; Frames, Wiring 236, 247, 449, 667, 758, 759, 801, 1011; Frames, To Wire 393; France Legally Elected 95; Fumes, Poisonous, from Hive 637.

Gasoline as a Motor 581; Gasoline v. Bisulphide for Mot' 285; Gasoline engine for Extractors 131; Gasoline-engine for Extractors 334; German Press for Squeezing Honey 336; German Wax-press 1011; Ginseng, a Warning 426; Gleanings, Articles 339; Gleanings, Binding 158; Gleanings, Cover 47; Gleanings Make-up 552; Gleanings as a Text-book 224; Gleanings, Subject-Matter of 292, 343, 398, 449, 637; Gloves, see Bee-gloves; Glucose Dealer Fined \$25 157; Government Aid for Bee-keepers 96, 327, 838; Government Aid for Bee-keepers 838; Grand Canyon Illustrated 332, 846; Greiner's Bees 276; Greiner's Filling-device 287.

Heartsease in Nebraska 62; Hive of Brick 592; Hives in the Cellar 342; Hives Painted a Warm Color 62; Hives on Stakes 424, 843; Hive, Danzenbaker, for Swarms 63; Hive, Bingham 801; Hive, Large Observatory 961; Hive, Opening it Too Much 933; Hive, Samson's 248; Hive, Standard 685; Hives, Danz v. Langstroth 243; Hives 8 or 10 Frame 87; Hives 8-frame Jumbo 432; Hives, Painting with Bees in 345; Hives, Shallow, Discussed 671; Hives, Shallow 383, 484, 546, 681, 800; Hives, Shallow, Profits in 276; Hives, Stealing, Penalty for 343; Hives, Tenement 338; Hives, Uniformity in 954; Hives-bodies, Depth of 153; Hive-cover, A. C. Miller's 632; Hive-covers of, Zinc 664; Hive-covers, protecting 679; Hive-numbering Tags 445; Hive-stands 911; Hive-stand, Callbreath's 631, 885; Hive-stand, Cheap 392; Hive-stand, Danzenbaker 835; Hive-stand, Phillips' 198; Hive-stand, Root's 836; Hive-stand of Stakes 392; Hives-tags 474; Hiving Automatic 951, 952, 929; Hochstein's Unclipping-device 699; Hoffman Frame see Frames; Holtermann on Fertilizing in Confinement 94; Holtermann's Tent 448; Honey Business, Profits in 372; Honey Canning 929, 1044, 1045; Honey Capped Whiter from Forced Swarms 151; Honey Consumed in Cold or Mild Weather 132; Honey as Food 237, 871, 963; Honey and Wax Produced 794; Honey for Grocers 237; Honey Flora of Nebraska 59; Honey in Large or Small Doses 728; Honey from Mexico 529; Honey Years, Good, Returned 686; Honey Sold by Express Co.'s 242; Honey Yield, Miller's 832, 872; Honey by Express or Freight 320; Honey in Box 384; Honey in Paper Bags 343, 1008; Honey in Pompeii 477; Honey, Adulterated 684; Honey, Advertising 437; Honey, Apple-blossom 432; Honey, Bad-smelling 152; Honey, Big Crop 678; Honey, Boiled for Dyspeptics 150; Honey, Bottled, Selling 144; Honey, Bulk, in Mexico 285; Honey, Canded, No Sale for 285; Honey, Canning, Why Bees Fail to 63; Honey, Care of 189; Honey, Comb, Production of 54; Honey, Dark 381; Honey, Extracted, 374; Honey, Healing Power of

INDEX TO GLEANINGS IN BEE CULTURE

VOL. XXXI.

General Correspondence.

Acid, Formic, in Honey 638; After Swarming, see Swarming; Agates Soaked in Honey 529; Aikin's Candied Honey 318; Aikin's Candied-honey Package 1008, 1045; Aikin's Honey, Stenog on 133; Aikin's Paper Bag for Honey 191; Alexander's Extracting-room 490; Alfalfa Honey, Future of 331, 332; Alfalfa and Butterflies 199, 246; Alfalfa Cut Late or Early 138, 139, 331, 332; Alfalfa in Idaho 103; Alfalfa for Horses 807; Alsike for Red Clover 450; Alfalfa Hay, Age of for Horses 18; Alfalfa, Hay 951; Alfalfa, 3,000 Acres 21; Alfalfa, Effect of Butterflies on 148; Alfalfa, Cutting after Bloom 393; Alfalfa, Time to Cut for Hay 138; Alfalfa-growers 550; Alighting-boards of Canvas 726; Alley's Queen-rearing 995; Alley's Queen-rearing Complicated 958; Alley's Book 958; Alsike Pasture 318; Alsike 246; Alsike Clover 278; Ants and Cockroaches, To Kill 476; Apiaries in California 791; Apiaries of Mr. Hooper 540, 543; Apiary in California 842; Apiary of Old Bee-keeper 290; Apiary, Alexander's 489; Apiary, Arrangement of 244, 339; Apiary, Culvey's 844; Apiary, Mercer's 964; Apiary, Model California 925; Apiary, Shedded 719, 722, 725; Apis Dorsata and Other Races 327; Apis Dorsata, Experiments with 96; Arizona, Plants of 1046; Australian Bee-keeping 679; Auto, A. I. R. on first Trip 424; Automobile v. Horse 477; Automobile and the Drinking Man 579; Automobiling 89.

Bags for Candied Honey 1008; Bags for Honey, see Paper Bags; Barn, Large Dairy 22, 23; Barrels and Cans, Testing 372; Barrels Tested with Bicycle Pump 153; Barrels, Atchley on 717; Basswood Lumber 752; Basswoods from Seeds 8; Basswoods Not Blooming 663; Basswood, Substitute for 847; Bee Culture in Germany 911; Bee, Ration of 831; Bees for Moving 675; Bees Inside of Buildings 924; Bees under Sheds 719, 721; Bees in Orchards 529; Bees Loafing 847; Bees and Stings 727; Bees in a Pound 685; Bees Fed Not Stimulated 398; Bees in Granary 924; Bees as Embalmers 807; Bees up Trousers Leg 818; Bees Chilled to Death 341; Bees in Venezuela 799; Bees by Freight 274; Bees Carried Out in Winter 160; Bees Dying in Winter Quarters 154; Bees in Florida 7; Bees, Abdomenless 579; Bees, Best, Hutchinson on 581; Bees, Black, None in Colorado 371; Bees, Black or Italian 954; Bees, Cellared, Long Confined 48; Bees, Coloring Matter in 423; Bees, Exhibiting 961; Bees, Foreign Races 96; Bees, Frozen, Revived 498; Bees, Infuriated 966; Bees, Insuring Against Fire 337; Bees, Insuring 767, 849; Bees, Leather and Golden Colored 246; Bees, Long-tongued 48; Bees, Moving 871; Bees, Moving 1014; Bees, Moving 847; Bees, Moving in Hot Weather 884; Bees, Moving Short Distances 199, 344, 494, 1045; Bees, Non-swarming 682; Bees, Poisoned 595; Bees, Poisoning 842; Bees, Poisoning 1012; Bees, Removing from Combs 274; Bees, Removing from Tree 155; Bees, Mortality of in Wintering 63; Bees, Red-clover 724, 725; Bees, Sontary 768; Bees, Wingless 929; Bees, Young, for Queen-rearing 88; Bee-brush 751, 764, 850, 1013; Bee-brush of Pine Needles 596; Bee-brush and Scraping-knife 154; Bee-cells, see Cells; Bee-feeder, Ferris 64; Bee-gloves 768; Bee-house and Cellar, Model 160; Bee-journal Reading

758; Bee-keeper on the Kickapoo 337; Bee-keeper's Life—Poem 147; Bee-keeping in California 792; Bee-keeping in Jamaica 487, 539; Bee-keeping Migratory 722; Bee-keeping, Popularizing 579; Bee-moth, Keeping from the Combs 633; Bee-ranch, In-mense 21, 24; Bee-sifter 759; Bee-tree, Getting Bees Out of 155; Bee-trees, Laws Concerning 849; Bee-trees, Removing Bees from 549; Bee-trees, Robbing 246; Beeswax, see Wax; Belles, Arizona 833; Bologna Sausage, see Honey in Bags; Bottom-board Feeder 445, 1011; Bottom-board, Tilting 551; Bottom-boards Fastened, Hindrance 449; Bottling Device 287; Brood for Forced Swarms 157; Brood to Hold Swarms 345; Brood Near Top-bar 832; Brood Black, Not Among Hershiser's Bees 106; Brood Chilled 911; Brood-chambers, Shallow 334; Brood frame, Introducing-cage 240; Brushed Swarms, see Swarms, Forced; Buckbush 59; Buckwheat Honey York State 758; Bulk Comb Honey 14, 143, 496 1014; Burnett on Unripe Honey 590; Burr-comb Tool 767; Butterflies on Alfalfa 148, 199.

Cacti for Honey 1009; Cage for Queen 685; California Crop 683; California Honey Association 88; California Honey Association 382; Callbreath's Hive-stand 631; Canards, Honey 1045; Cans, Square To Fill 931; Cans, Testing for Leaks 372; Candied Honey in Paper Bags 191, 1008; Candied Honey Not Salable 285; Candied Honey, Aikin on 191, 195; Candied Honey, Aikin's 384; Candied Honey, Selling 548; Candying, Hastening or Retarding 596; Canvas Alighting boards 726; Cappings, To Melt 423; Carbon Bisulphide 334; Carniolan-Italian Cross 149; Carpe Grass 65, 141, 553, 680; Catalpa for Honey 65; Catnip at Dr. Candy's 59; Cellar v. Outdoor Wintered Bees 912; Cellar Partitioned off 1009; Cellar, Miller's Furnace-heated 1008; Cellar, Hilbert's 805; 832; Cellar, Putting Bees in 449; Cellared Bees Long Confined 48; Cellared Bees Mutilated 152; Cellars in Rock 498; Cellars, Dampness of 805; Cellars, Ventilation of 493; Cell Cups of Wood 931; Cell-cups, Pressed 245; Cell-forming Stick, Carter's 245; Cell-forming v. Queenless Cells 145; Cell protector 842; Cell-starting, Swarthmore Plan 5; Cells above Zinc 844; Cells Gnawed down by Bees 155; Cells in Upper Stories 345; Cells, Young Brood 619; Cellars or Bee-caves 9; Cellar, Few Colony in 928; Cellar, Ventilation, Dampness, etc. 39; Cellar, Wet, Good Wintering 394; Cellars, Bee 15; Cellars, Temperature of 15, 331; Cellars, Temperature Variable 372; Cellars Ventilation of 331; Celluloid v. Wax for Foundation 160; Chickens Eating Queens 1010; Chunk Comb Honey, see Bulk; Churches, Decay of 48; Clipped Queens, Where to Find 65; Clover, Crimson, or Sweet for Bees 150; Clover, Sainfoin 846; Clover, Sweet 223, 765; Clover, Sweet, v. Alfalfa 807; Clover, Sweet, in Kansas 929; Clover, White, Yielding first Year 103; Clover, White, First Growth 548; Clover, White, in New York 769; Clover, Year of Blossoming 131; Cockroaches, To Kill 450, 684; Cogshall on Being Posted 758; Cogshall on Frames 485; Colony in a Garret 290; Colony in Open Air 593; Colony Refusing a Queen 931; Colony, Obstreperous 276; Colony, Size of 579; Colony, Non-swarming 7, 47, 157; Colony, Manipulat-

